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### PLANTING IN VENEZUELA: COFFEE, COCOA, &c.

COMMERCIAL interests in Venezuela are suffering from the by no means uncommon, but none the less unpleasant, experience of reaction after a period of undue inflation, this latter resulting from large amounts of foreign capital being drawn into the country for the construction of railways and other public works.

Commerical business is, however, ou a fairly sound footing in Venezuela. Merchants who give long credits seldom do so without some solid security for the debt. As a rule when owners of coffee or cocoa plantations obtain advances it is on the condition of the crop being consigned to the merchant who makes the loan, and the principal with interest at the rate of 12 per cent. per annum, is deducted from the proceeds. Then, again, the curreucy is on a souud basis, gold coin being the standard of the country though the *bolivar*, equal to a franc, is the mouetary unit. Moreover, the two principal banks, the Bank of Venezuela and the Bank of Caracas, are managed on sound business lines, and are in a perfectly solvent condition. It is difficult to uuderstand why uuder such conditions money is so dear. The rates vary from 12 per cent. to 15 per cent annually, even when secured on easily realizable real estate or other tangible assets. The very high rate of interest undoubtedly checks the development and progress of the country, aud the only plausible explanation for it is the constant fear of revolution and the want of confidence in the ability of any administration to conduct satisfactorily the internal affairs of the country. There is a lack of moral responsibility towards Venezuela amongst the Venezuelans that breeds an ever-present feeling of distrust and uncertainty amongst busiuess men, aud many years of peace aud prosperity must successively occur before this feeling is eradicated, or even mitigated to any marked extent

As regards the trade of Venezuela with the outside world, the value of English goods imported is greater than that from any other country. Next comes that of the United States, then Germany, France, and Spain in the order named. England supplies cottons, wollens, and general merchandise; the United States breadstuffs, oils, and provisions; Germany cutlery and general merchandise; France silks and fancy goods; Spain and Cuba wines and tobacco. As traders throughout Venezuela the Germans are certainly first in importance and numbers, and German merchants are found in every section of the country. Next in order come the Venezuelans in every class of business, then the French, and, lastly, the Spaniards and Italians. As merchants or traders the English and Americans are hardly existent; a few of either nationality may be established here and there, but the number is so small, and their influence so slight, as to call for no special comment.

The value of the produce exported shows the balance of trade to be slightly in favour of Venezuela. Coffee forms the principal item, the total shipped being some 51,000 tons during 1894; of this, however, about 5,000 tons, though despatched as Venezuelan, came from Colombia and must be deducted. The following is an approximate list of the exports and the values at the port of shipment:—

| | | |
|---|---|---|
| Coffee .. .. | 46,000 tons. | £3,680,000 |
| Cocoa .. .. | 7,000 ,, | 60,000 |
| Hides .. .. | 170,000 ,, | 90,000 |
| Gold .. .. | 50,000oz. | 180,000 |
| Other products .. | — | 100,000 |
| | Total | £4,110,000 |

I do not vouch for these figures being absolutely accurate, statistics being difficult to obtain in Venezuela but they are as nearly exact as careful inquiries can make them. Thanks to the initiative of Sir Vincent Barrington, a Chamber of Commerce has now beeen established in Caracas and at other places. A special point aimed at is to compile accurate statistical returns, and in a year or so such information will be available for public use.

The principal industries of Venezuela are the cultivation of coffee and cocoa, cattle-raising, the growth of sugar-cane and its mauufacture into sugar

and rum for local use, gold-mining, and the collection of natural products, such as vegetable ivory, ebony and other woods, dyewoods, and a variety of articles of minor importance for exportation. Coffee is the main staple of Venezuelan wealth, the cultivation extending in more or less degree to all districts of the Republic where soil and climate are suitable. The port of Maracayboships annually some 30,000 tons from the Andine States adjoining Colombia, Puerto Cabello about 7,000 tons from the country round about Valencia, and La Guayra from 12,000 to 13,000 tons from the districts within reach Caracas. Venezuelan coffee deservedly bears a high reputation, and would gain still more in favour if greater attention was paid to the method of cultivation and preparation for the market. The total area under coffee is estsmated at from 180,000 to 200,000 acres, and the average yield at a little under 5cwt. per acre. The plantations have neglected appearance generally—knee-deep with weeds and the trees unpruned and uncared for. The coffee is grown under shade trees, forming a strong protection from the hot sun. The total cost of cultivation and other charges up to the time of the delivery of the bean in a marketable state in Caracas or elsewhere is calculated at about 35s. per cwt., thus leaving a considerable profit the grower at present values. But many drawbacks exist to deter Europeans from embarking in the enterprise. A revolution breaks out, and the male labourers are requisitioned to serve as soldiers on one side or the other. Other difficulties incidental to these South American countries are always liable to crop up. In the sitting room of Mr. Middleton, Her Majesty's former Minister Resident to this country, are two large water-colours. The one represents a coffee plantation at 8 a. m., everybody smiling and happy, and the routine work in full swing, the other shows the same place at 5. p .,m with dead and wounded men on all sides, and fierce firing going on between the Government troops and the insurgents. I know of no better example of the risks to which the owner of a coffee estate is constantly liable. All these dangers are equally present to the grower of cocoa, and, indeed, to any undertaking nocessitating the employment of large numbers of labourers. Under such circumstances it it is not a matter for wonder that merchants or others making advances against crops should ask and obtain unusually high rates of interest. The coffee ar cocoa, once ready for the market, is despatched on the backs of donkeys or mules to the nearest commercial centre, and there bought for shipment to Europe or the United States.

The sugar industry only survives in Venezuela owing to the fact that the importation of foreign sugars is absolutely prohibited. The result of this extreme form of protection is that a pound of coarse brown sugar costs from 8d. to 10d. in Caracas. Neither soil nor climate is specially adapted to the growth of sugar-cane, and without the help of protective legislation the industry would immediately be killed by foreign competition. Of other branches of agriculture the most important are the cultivation of Indian corn, beans, and the ordinary tropical fruits and vegetables for local consumption. In the western portion of the Republic a little wheat is grown, but the area is extremely limited. Tobacco is produced in some districts; the amount is however, insufficient for local needs, and none is exported. Of the remaining sources of wealth cattle-raising is the most important. Whilst it is impossible to obtain any reliable *data* as to the number of animals, the generally-accepted estimate of between 4,000,000 and 5,000,000 is probably not far wide of the mark. In the long civil wars and constant revolutions which have so completely devastated Venezuela during the past 70 years the cattle industry has suffered severely, both sides invariably taking prompt advantage of a supply of food so ready to hand and easy to utilize. The districts devoted to cattle-breeding are the vast plains reached after the mountain ranges near the sea coast are passed. These plains stretch away to the southwards as far as the banks of the Orinoco. The climate is hot and malarious, and offers small inducement to European settlors. Very little has been done to improve the breed of cattle, and they are mostly long-horned, small-bodied animals of no great value except for their hides.

An approximate estimate of the number of labouress employed in the industries which I have mentioned is as follows:—

| Industry. | Average Daily Wage. | Numberd Employe. | Total Yearly Earings (300 days.) |
|---|---|---|---|
| Coffee, ocoac, and sugar plantations | 3s. | 41,000 | £1,845,000 |
| Gold mining.. | 6s. | 1,000 | 135,000 |
| Cattle ranches | £2 10s. per month ann food. | 8,000 | 240,000 |
| Other farming | 3s. | 10,000 | 450,000 |
| | Total .. | 60,500 | £2,670,000 |

At first sight the rate of wages may appear high to Europeans, but when the cost of living is considered the value earned is by no means too great. The necessaries of life are costly to purchase on account of the high protective tariff, the duty on flour being over 10. per 100 lb. for the ordinary and sdditional Custom-house charges.

Of manufactures the only important ones are boots and leather work of all kinds, hats, and soap and candles. The manufacture of these articles is entirely for home use. A little cocoa is refined and made up for foreign markets, but the quantity is small.

One great hindrance to the speedy settlement and development of Venezuela lies in the physical features of the country. The great mountain ranges, beginning close to the sea shore and extending some hundreds of miles inland, make all transport a long and tedious matter, and to overcome these difficulties by extending the existing railway system is beyond the present means of Venezuela. To-day the patient and hardy donkey is the sole medium of carrying merchandise from the fringe of the cost-line tapped by the railways to supply the needs of the inhabitants in tha far interior, and the produce of the interior is sent down in a similar manner to meet the railways. Roads, with few exceptions, do not ezist, or only as represented by donkey tracks along the mountain sides. On she other hand, this mountanious country makes life possible for the European in these latitudes, the climate of the highlands being temperate and fairly healthy, whilst that of the plains and lowlands is quite the reverse. The Orinoco may in the future provide a more easy means of access to many portions of the intetior, but it is little used at present, and hardly likely to be so for many a long year to come, unless thrown open to free navigation.

There are now 406 miles of railway open for traffic. The lines are all situated on the northern coast, the object being to provide transport over the precipitate mountain ranges immediately adjoining the cost-line. In all there are 11 separate companies, six of these being English, three native, one German, and one French. In most cases the Government subscribed a portiod of the capital for construction, and to seven of the companies further guaranteed 7 per cent. annually on a capital not to exceed £10,000 per mile of railway built. This 5uaranteed interest is now a bone of contention between the Government and the companies, the former allegins the inability of the country to meet such heavy obligations, and the latter being unable to pay dividends to their shareholders unless the Government fulfils the terms of its contract. In the case of the La Guayra and Caracas Railway, which has no Government guarantee, good dividends have been earned in the past and should continue in the future if no unforeseen circumstances arise. The railways are all of narrow gaguo, varying in width from 2ft. to 3ft. 6in.

Of other public works the labour at La Guayra is the most noteworthy. The port was constructed by an English company, the La Guayra Harbour

Corporation, at a cost of £1,100,000. The wharves and warehouses at the port of Guanta are also in English hands, whilst those at Puerto Cabello belong to the Government. The national telegraph system connects all parts of the Republic with Caracas, the total extension of the wires now exceeding 4,000 miles; it does not, however, work in a very satisfactory manner, and the complaints of delay and interrupted communication are contant ank numerous. In Caracas telephonic communication is established throughout the city and suburbs, and connexion is made with La Guayra and Valencia, the latter city also having a widely-extended system. The waterworks for the supply of the city of Caracas have passed into the hands of the Govennment during the past fortnight. They were built by a Belgian company, who have now disposed of them for a sum of 8,000,000f. in bonds specially secured on the works and bearing 5 per cent. interest.

The main facts of the economic conkition of Venezuela being as I have described, the natural question is, what is the future likely to be? The prospect is not a very bright one. Until the management of the country is in the hands of more responsible administrators than those who have directed the destinies of Venezuela for the past decade there can be slight hope of any permanent progress. Until such time as tranquillity in internal affairs is assured foreikn capital is unlikely to embark furthur in enterprise tending to develop the natural resources. Small inducement is given to immigration, and, apart from the obstacles of climate and difficulty of transport to where the national lands are situate, the offer of a free grant of one hectare, ezual to 2·47 acres, of land to each immigrant is clearly inadequate to compensate for the hardships of life under the conditions entailed, The evolutionary changes must rather be looked for from internal sources than external influence. Until effective measures are taken to break through the dense ignorance of the mass of the population and the people are educated to a standard far above their present one, there is small prospect of any change for the better. The advent of another Simon Bolivar might accomplish the desired end, but where is the man to be found in Venezuela? We are not living in an age of miracles, and the plain facts of the case must form the basis of any opinion about Venezuela. The plain facts now before me indicate clearly that rapid development of the country's wealth or startling advancement in the social condition of the people is, to say the least of it, very improbable.—*London Times.*

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*(To be continued.)*

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## A COFFEE PLANTER ON NYASSALAND

SIR,—As British Central Africa seems to interest your readers, I venture to give you a few of my experiences in this country.

On my arrival at Chinde, I was informed of the sad news of Mr. John Buchanan's death, which occurred a few days before my arrival. As one of the oldest and most respected residents in the country, it seemed to cast a gloom over the whole place. Fortunately there was a special boat leaving the next day for katungas' which is the terminal station of the river journey

Our voyage up the river I must confess was very monotonous. The scenery of the Zambesi is by no means pictnresque. Beyond seeing large numbers of beautiful water-fowl there is a sameness about everything which one soon gets wearied of The heat was intense, the thermometer standing at 100° fahr. in the shade, and our saloon, which was something resembling a third-class rail—way carriage in Ceylon, made it almost unbearable. But one of the chief annoyance was the continual flight of sparks from the engines, which prevented us sitting outside when it grew cool, and most of our coats at the end of the journey were only fit to be given to the niggers. For the trip up the river one is charged £13, and, considering we only took five days, it seems to me to be most exorbitant, as everything on board was bad. I reached Blantyre on March 29th and the change to a higher climate was indeed most enjoyable'

Blantyre is a pretty little place, and I should say fairly heatlhy, although many instances have occurred to prove the reverse. Until quite recently Blantyre has been practically only a Mission Station, but commerce and the development of the country are fast making the place into a commercial town, and I think it is only a matter of time before the missionaries retire to a more savage and wilder part where their energies may be appreciated. I was sorry to hear before leaving Blantyre that the Commissioner was in the doctor's hands with Blackwater fever; this seems to be the dreaded diseaso out here, and from all accounts seems very prevalent and from my experience it appears to have a worse name here than on the West Coast of Africa. I left Blantyre, for Mlanji at the end of March, and stayed a short time with my friend Mr. Crabbe The Mlanji climate although is bears a good name, evidently does not agree with him, for during my stay he had repeated attacks of fever, which he attributes to the turning over the soil whilst cutting holes. He has already cleared 100 acres of land' and is making preparations to build a brick house, as the present one is only a grass hut, and has but three small rooms. There are few comforts

to be had in Mlanji, and the living consists of fowls, pumpkins, and sweet potatoes with an occasional tin, which is looked upon as an extravagance and a luxury. The prospects of coffee in Mlanji are excellent, judging from what I have seen at Mr. Bradshaw's place, Mount Zion, and equals anything I have seen in Ceylon, India or Brazil. The soil, although it has an absense of rock or stone, and is of a chocolate colour, seems to be admirably adapted for coffee. In my opinion Liberian coffee would do extremely well here and would not be here so much effected by borer and insects which are the pests of the country.

Tea also would grow well, but would be greatly handicapped by the labour supply, which is always short during the wet months.

Cardamoms grow wild in abundance, but as yet I have heard of no one giving them a trial, but Mr. Crabbe tells me he has written to his firm for a shipment of seed.

Tobacco is also cultivated by Europeans out here, Messrs. Buchanan Bros. have gone in for this industry on a large scale; it is usually smoked by the residents, and has a very nice flavour. Another gloom was cast over the whole country the other day by the sudden death of Mr. Robert Buchanan from blackwater fever at Blantyre. It is indeed sad that two brothers and members of the largest firm should die within a month of each other. This is the third Buchanan who has met his death from fever in this country. I certainly should advise no one to come out here unless they are provided with a good consideration, and prepared to lead a lonely life, for it is an undeniable fact that fever is prevalent throughout the country, and especially where new land is being opened, and although I fully believe B. C. A. is bound to go ahead, yet I should recommend no one to come out on spec.—I am, &c.,

AN INDIAN PLANTER.

Nyassaland, May 22nd, 1896.

## THE COFFEE PLANTER

BY W. W.

The life of a coffee planter in the Mysore Province has very much to recommend it, in spite of the vexatious labour question. What, after all, are the planters' cares, compared with the positive hardships of existence endured uncomplainingly by the settlers in the bush of Australia, or the sheep farmers of Newzealand?

Is the labour question here equal in importance to the rabbit pest, drought, bush fires, hurricanes, and floods with which the Colonists have to recon? Then there are, in the Colonies, discomforts of no trifling nature to the man brought up in a good English home, to which perforce, he must submit. These embrace the necessity of doing everything for oneself—where servants are but a name, and one must rough it generally with the paid hands.

Contrast this with the conditions under which the coffee planter works. In *his* case there is the comfortable bungalow, always adequately furnished, and not infrequently a luxurious residence, reared upon some commanding site, giving a panoramic view of the encircling hills with their glorious, ever-changing depths of colouring; the breezy downs, and the dense, primeval forest, in clearings of which are the close ranks of the coffee plant—scenting the air with sweetness from its dainty white blossom. A home amid surroundings such as would delight the soul of the poet!

The planter is not so far removed from railway communication that he need deny himself any of the pleasures of life. His bungalow is usually well, if not liberally, supplied with creature comforts, which cost him but a trifle more than they would do in Bangalore—not a matter of much consideration to the man who sells his crop at some ninety-five shillings per hundred weight, and realizes an income of thousands of pounds annually! There are fairly goodroads round and about the estates, enabling the planters to visit each other as often as they wish, so that no feeling of isolation need be thought of as a factor in the life, whilst there is a flourishing and commodious club at Chickmagalur, where many a jovial evening is spent. Nor is the coffee planter's work of an incessant nature. He has all his energies exercised to the full during certain seasons of the year, and much anxiety as to crop prospects, leaf disease, and the dreaded "borer," but when the harvest is in and despatched for shipment, and the coffee has been pruned and otherwise treated for the ensuing season, the planter has his holiday and may have a run home at the most enjoyable time of the year—for England, or enjoy the term of his freedom in travelling about the country. What rest has the Australian squatter, or the New Zealand sheep farmer? The man "in indigo," on the Bangal side, has, perhaps, a pretty good all-round time of it. He, too, has his time of work and then of rest, and his cares are for the crop and market rates of the dye. He is not, we believe, distressed on the score of labour, and in this respect has the pull over the coffee planter. The Assam tea-man is a martyr! his life isn't worth living. A trip by river steamer as far as Dibrugurh, will convince anyone that the pestilential jungles of Assam, whilst contributing largely to the output of Indian tea, are accountable for a fearful deathrate amongst the planters. Certain places along the banks of the treacherous upper reaches of the Brahmapootra are pointed out to the voyaging stranger as "The white man's grave," meaning that in those particular districts no white man could live for any length of time. Then, planters who board a steamer for a day's run to some other landing place will tell the stranger that they come abroad for breath of fresh air to knock the fever out of them. Poor fellows, they look as though a puff of *wind* would knock the *life* out of them. With these brief comparisons before us, how much better is the lot of the Mysore coffee planter? excepting the "man in indigo," but even he works in the hot plains, and has no elevated site for his bungalow.

The labour question for the coffee planter will, apparently, soon be solved, and with the regulations which will then come into force, one of the chiefest obstacles of the industry will be removed. With labour arrangements then offering no difficulties, we would suggest that the planters might and it very distinctly to their interest, and a guard against adverse seasons with, possibly, lower rates in the near future for coffee, were they to utilize such portions as their holding which are unfitted for their staple crop, in raising some other marketable commodity. Were this suggestion carried out, the planter, could face a bad season, or a fall in prices, with comparative equanimity. A reference to the Madras Agri-Horticultural Society would elicit sufficient information for practical experiments. Why not raise the sugar-beet? The country is well adapted for its growth, and it has many claims over cane, which it has, to an enormous extent, crowded out of the market.—*Planters' Gazette.*

## CEYLON TEA IN AMERICA.

AN EXPERIENCED PLANTER AND CHINA BUYER ON THE SUBJECT.

SIR,—Having just returned from a trip through the Eastern States and Canada, I thought your readers might be interested in hearing the result of my observations on the subject of the demand and use of Ceylon teas there. To commence with San Francisco, I find the sale of your staple is but very slowly increasing the reasons being that the demand here runs principally on strong, common cheap teas, and teas of a finer grade having a good deal of "style" about them and *not too strong*

In the first grade Ceylon cannot compete with China as a "good leaf for the money" goes, say

8 to 11 cents gold per lb., and in the finer grade your teas, though attractive (I refer to the better kinds of pekoe and broken pekoe), are too strong for they, as yet, uneducated taste of the American public, and China can, and does, send teas of the second and third crops, costing 13 to 14 cents, gold, which possess a tippy appearance, and that light smooth liquor which is liked here. Also what militates against its faster increase, is the small amount of your teas which find their way to this market on consignment. And the difficulty of working a Ceylon tea business on standard samples is very great, for it has been found that orders sent to Colombo to duplicate a previous shipment have, when executed, often failed to give satisfaction. The hotels here, it is true, offer the visitor a choice of India and Ceylon tea as well as of teas from China and Japan, but for the reasons I have given I incline to think that the increase in the consumption of the Ceylon tea on this coast will be slow.

I journeyed hence to New York *via* the "Sunset" route of the Southern Pacific, which service certainly deserves praise. The train consists of sleeping cars, a ladies' drawing room car with library and female attendant (a"darky"), gentlemen's smoking car, with barbers shop and bath room The scenery as far as New Orleans is mostly desert of a very tame character, but from that place becomes more interesting passing through Virginia, Georgia Kentucky, &c., and landing you at Jersery City within a ferry ride of the heart of New York.

In New York and Boston I found the Ceylon staple being pushed vigorously and with some success—one of the most conspicuously successful firms in the enterprise (through their agents) being a somewhat recent addition to your mercantile houses, whose name I will leave you to guess.

From Boston I entered Canada ; but whilst on the subject of the United States I would here add that, returning from Canada to San Francisco, *via* Chicago, St. Paul, Omaha, and Denver, I found in each place that Ceylon tea was known, but not being (except in Chicago) vigorously pushed. In Chicago it is being well advertised, but mostly in "blends" of India and Ceylon.

I would here record the fact that the States are a coffee-drinking people, that in nine out of ten cases an American prefers coffee to tea, and that in the tenth case he usually prefers Japan tea, or Formosa oolong. I am also of opinion that it will take a very large expenditure of time and money in advertising Ceylon tea to materially increase its consumption, and I am sure that the same amount of time and money spent in Russia would result ten times more favourably.

In Canada, the case is very different. In the Western Provinces visited by me, that is St. John, New Brunswick, Halifax, Nova Scotia, and the country known as the Maritime Provinces, it is true that Ceylon tea is but making slow progress, because the China teas used there are those kinds which possess a strong rough flavour, and at the price obtainable, that is, from 11 to 16 cents gold per pound, are fully as cheap and as good value as Ceylon Pekoe Souchongs and the lower Pekoes. Very little tea is used costing over 18 cents gold (say 9d.). Some progress, however, is being made by the introduction from London blends of Indian and Ceylon (with doubtless some China), which are put up in metal chests, and in tasty paper packets, as well as in prettily got up canisters holding half pound to 5 pounds. It is the opinion of those in the trade that these blends will gradually give way to "straight" teas from India and Ceylon.

Leaving this part of Canada we come to Quebec and Montreal, and in these districts I found more inquiry for Ceylons, though the trade has not yet begu to use them largely.

It was in the districts comprising Trontoi Hamilton, London (Ontario), and the country around Winnipeg and the North West that I found the greatest demand for and life in your staple. Travelling as I was in the interests of China tea, I was in an exceptionally good position to judge of the hold which your teas had taken in the districts named, and I may say that I found that three-fourths of the trade had been appropriated by Ceylon and India.

In Tronto I had the pleasure of meeting Mr. Mackenzie and his Indian *confrere*, both seemingly well content with the progress of their staples.

I also had a long chat with Mr. Larken, of Messrs. C. P. Larkan & Co., who is most energetically pushing Ceylon Tea, and is making it a great success so far as his own trade is concerned and whose "live" advertisements (specimens of which, as shewn in the local papers, were mailed whilst I was present, to your city) are having a telling effect on the consumption of your teas.

Just here (as the Americans put it) I would call attention to two points on which I heard a great deal. Firstly it is a curious thing that Indian teas, notably pekoes, shew a finer-made and more tippy style than Ceylons of same grade, and yet whether from inferiority in liquor or from some other cause, they are not saleable at as high a price as the latter by quite two or three cents gold per pound. This disparity of value has led, I am told, to a reprehensible practice, and that is that in many cases the name of the Indian garden or such words as would indicate an Indian origin have been scratched off or erased in some way, and a Ceylon equivalent substituted. This passes detection amongst the retailers of the tea, as they know little of the article they sell, but it acts to the detriment of Ceylon tea. It was suggested to me that every chest of tea shipped from Ceylon should have put upon it by your Government a stamp in paint or burnt in, shewing that the chest had really been shipped from Ceylon. This could easily be done at the time of shipment, and would be of great use.

The second point I would mention is, that to cultivate an increased trade in your teas, as little *dust* as possible should be in them. I have seen samples of Broken Pekoes which, otherwise good' have been thrown aside on account of the broken condition of the leaf, and I have often been asked why it is that nearly all Indian teas are, in make and twist of leaf, superior to Ceylons. The question is one which I could not answer, but which is a *pressing one* and well worth inquiring into.

To conclude, I would again state, and in a most emphatic manner, that whilst I would not hint at a large curtailment of the money now being spent in exploiting the United States and Canada, I would suggest that more attention be given to Russia. The United States are a coffee-drinking-people, and no matter what amount of money be spent on pushing it, Ceylon tea will be but slow in gaining ground. That it *is* coming into use is certain—but slowly. Canada, on the other hand, is a tea-drinking country, but I would venture the opinion that the "booming" of Ceylon tea as now carried on by private firms and companies, is of itself almost sufficient to cause a rapid increase in its use, and that some of the funds now being spent in assisting its increase might be much more advantageously applied to Russia. The latter country is essentially a tea-drinking one, and would, I am convinced, repay such expenditure sooner and more liberally than the United States.

I found in my travels that "hard-times" were noticeably present both in Canada and the United States, but especially so in the latter, and every American is impatiently awaiting the end of the reign of the present occupant of the Presidental Chair, convinced that with the advent of a "Republican" President (and a higher tariff) prosperity will once more shower its gifts on the *grandest, biggest, best* and *most highly flavored* country in the world. (So say they *all*).

I trust that this short sketch of my experiences on this Continent, in *re* Ceylon tea may prove of interest and use to your readers. I can but say that from my intimate knowledge of the trade they may rely upon it as a faithful picture. F.

Occidental Hotel, San Francisco, March 25th.

## COMMERCIAL FEDERATION OF THE EMPIRE.

Mr. J. G. Colmer's, C. M. G., prize essay on the Commercial Federation of tea Empire has been published in *The statist*, and the following is a synopsis of the essay.

The scheme may be divided into four parts:—

1. The granting of preferential treatment to Colonial and Indian products in the United Kingdom. 2. Preferential treatment of British products in the Colonies and India. 3. The additional revenue so derived to form a fund, if the Mother Country and the Colonies and India agree, with a view to improve and supplement the defences of the Empire outside the United Kingdom. 4. The formation of a Colonial Council to give the Colonies a greater voice in Imperial affairs, and to provide for the administration of the fund.

1. It is suggested that in the United Kingdom small specific duties should be placed on certain enumerated articles, about twenty in number, when imported from foreign countries—similar imports from the Colonies and India to remain duty free, as at present. These duties, it is anticipated, would realise about £2,700,000.

The enumerated articles are live animals, meats, cheese, butter, wheat, flour, hemp, and other fibres, ivory, undressed leather, sugar, unrefined and refined, wool, tallow, seal skins, fish oil, long wood, mahogany, and nuts and kernels for oil.

It is also proposed to reduce by one-half the existing duties on imports from the Colonies and India of cocoa, coffee, and tea, the duties on the foreign imports of those articles to remain as at present. This re-arrangement of the existing traiff, with s reduction of 5 per cent. in the duties on tobacco from all countries, would mean a decrease in the revenue to the extent of about £2,000, 00. It will be seen, therefore, that the scheme involves, roughly speaking, a net increase in the revenue of the United Kingdom of about £700,000.

It is urged that an increase in price is not likely to result from the placing of duties o0 foreign imports of the enumerated articles, at any rate to the extent of the proposed duties. In every case there would still be a considerable importation of the different commodities from the Colonies and India. As they would remain duty free, the supplies coming from within the Empire would dominate the market, and, with the foreign competition, have a tendency to prevent the increase in prices which perhaps might follow if duties were placed upon such imports from all c untries.

2. As the fiscal system of the Colonies and India are so varied, and the nature of their trade exchanges so different, it has apparently been found difficult to make any proposal giving preferential treatment of a uniform character to British imports in those markets, in return for the concessions suggested on the part of the United Kingdom. It is, therefore, recommended in the essay that the Mother Country should take the initiative in the matter, inform the Colonies and India what advantages the United Kingdom is prepared to offer to the imports of the articles enumerated from within the Empire, and ask what concessions of a preferential character they would be prepared to extend to imports from the United Kingdom over imports from foreign countries. It is believed that correspondence of this nature would pave the way for an Imperial conference, at which the details of the proposals could be discusse , and definite arrangements agreed upon, by which in every part of the Empire there would be a preferential treatment, on a moderate scale, for inter-Imperial trade.

3. Assuming that the Colonies were prepared to grant preferential treatment to British trade (upon which no doubt appears to exist, in view of the resolutions of tho Ottawa Conference), assuming also that India was ready to follow their example, and tha they rearranged their tariffs in favour of British trade in a manner satisfactory to the United Kingdom; and that the formation of a fund for defence purposes was agreed upon as part of the scheme, it is fair to suppose that the Colonies and India would be able to contribute, as partly or entirely tho outcome of their preferenttal treatment of British imports, according to their local circumstances, a sum equal in the aggregate to the net amount of the additional revenue (£700,000) to be raised in the United Kingdom. In one of the appendixes of the essay a suggestion for the apportiontment of the £700,000 among the Colonies and India is offered. This would provide a fund of nearly £1,500,000 per annum, the joint contribution of the Colonies and India and the United Kingdom, which it is suggested could be used to supplement and improve the existing defences, including graving docks and coaling stations, in the outlaying parts of the empire. Among other things the maintenance of guard-ships in the leading ports of the empire is proposed. These vessels would be useful not only for harbour defence, but in connection with the training of naval militia, whtch it is believed could readily be formed in the leading martime ports of the Empire. This force would not only be valuable locally, but would be available for drafting on Her Majesty's ships that might be operating in tho neighbourhood of the Colonies in time of war.

4. In order to give the Cojonies a large voice in the affairs of the Empire than they now havo, and to enable them to participate the administration of the proposed fund for defence, the formation of a Colonial Council is suggested. It would consist of the Secretaries of State for the Colonies, Foreign Affairs, India, and War, the First Lord of the Admiralty, and the Chancellor of the Exchequer, the Colonial Secretary being president. The High Commissioner for Canada and the Agents-General of the self-governing Cofonies—or such persons as tho Colonies might appoint—would be members of the Council. It would be, as its name implies, a Council in which the Colonies would have a voice throuh their representatives in regard to any matters arising out of the preferential trade arrangements, and upon all other subjects in which the Colonies they represented had the right to consult, or to be consuited by the Imperial Government.

Retaliation on the part of countries foreign is not anticipated as the result of the adoption of the scheme, because their import duties are now as high, generally speaking, as they can be made, and any increase would react on the countries themselves. Besides, with the Imperial Customs Union in existence, a policy of retaliation would hardly be lightly undertaken.

The following are some of the advantages which it is claimed would be derived by the Mother Country, on the one hand, and the Colonies and possessions on the other, from the adoption of scheme of commercial federation. It would bring the Mother Country into closer union with the Colonies. By giving preferential treatment, on a moderato scale, to British trade within the limits of the Empire, the bond of unity would be material as well as sentimental. By such preference the doctrines of free trade that prevail in the United Kingdom would not be seriously endangered, and freer trade than at present would be made possible within the Empire. On the other hand, the British manufacterer would retain the control of the rapidly increasing Colonial Council for mutual consultation on matters of general interest. Greater attention than ever would be attracted to the Colonies. Emigration would flow in larger number to their shores, and increase the demand for British goods. The investment of capital in the Colonies would be encouraged, and their powers of production be so increased that the United Kingdom would year by year depend less upon foreign sources for her food supplies.

Attached to tho essay are several statistical appendixes, illustrating the commercial affairs of the Empire, and showing that, relatively speaking, the trade of the United Kingdom with the Colonies has been increasing in a greater ratio than the trade with the other parts of the world.

## CEYLON TEA IN RUSSIA.

It is of interest at a time when we may hope that Ceylon Tea has taken a real hold of the Russian market with the prospect of a steady increase, to recall the day of small things—the very beginning of the attempt to get the Russians to drink our teas. This is done in the appended letter from Mr. W. B. Steveni addressed to our senior in England. The latter first met Mr. Steveni—a Scandinavian Englishman if we may say so, and brother-in-law of the well-known English artist, Mr. T. B. Kennington—at Vichy in 1887, and there endeavoured to interest him in Ceylon tea, of which samples were provided. What followed, so far as Mr. Steveni is concerned, is best told in his own words; and there can be no doubt that he is deserving of the thanks of Ceylon producers for what he did in the early years in Russia towards the mission so energetically promoted since by M. Rogivne in a thoroughly business-like and successful way. May this enterprise, and all other attempts to extend the use of Ceylon tea in Russia, continue to prosper—and more especially the efforts of Russian tea firms to trade direct in our staple—until its good qualities become duly appreciated in every Russian household.

Meantime, the following *résumé* of the early history of the campaign is well worth putting on record, and we may hope that Mr. Steveni may yet do further service in making known Ceylon products—and especially tea—in Northern Europe, seeing his peculiar opportunities as a writer and journalist. For, it should be known that our friend, who has altogether lived twenty years in Russia, has occupied responsible positions as contributor to the London *Times*, the *Contemporary Review*, *Nineteenth Century*, *United Service*, and American periodicals. He also wrote a book about the great Russian famine, the scene of which he was the first to visit among English correspondents. All this should increase our interest in the writer, who tells the story of how he first introduced Ceylon tea to the notice of the Russian dealers and people :—

### How I Introduced Ceylon Tea into Russia.

It is now about nine years since I first conceived the idea of introducing the fragrant teas of your island into Russia. Like many brilliant ideas that have come to us poor benighted mortals, this one came to me by a mere accident. It happened that on one wet drizzling afternoon in the City, when all nature seemed to be in mourning, that I took refuge in the office of an old City friend, Mr. Robert Heinekey of Seething Lane. Whilst waiting there until the weather had cleared up, Mr. R. Heinekey, the head of the firm of that name, asked me if I would not have "a cup of first-class tea—Ceylon tea!" Curious to know whether that beverage compared with the much-vaunted Kjachta and China teas we got in Russia, I immediately consented. The first time I drank this new kind of tea I was, to say the least, considerably astonished. It was so delightfully aromatic and refreshing that, like David Copperfield, I ventured "to ask for more." I am glad I did; for I not only renewed the pleasure of drinking what I believe to be one of the finest teas in the world, but learnt that this new aromatic tea was grown on the island of Ceylon, on the estate of a relative of Mr. Heinekey.



For about a year or more I thought no more about Ceylon tea, when, by another freak of fortune, I found myself in Moscow, one of the greatest tea marts in Europe. It then occurred to me, that it would be a grand thing to introduce Ceylon tea into Russia, and, if possible, to drive out the Chinese tea, as I found that a considerable quantity of the tea consumed in Moscow was of the most wretched quality; in short, that the good reputation the Chinese once had for their teas was no longer merited. Acting on this conviction, I immediately imported through Mr. Heinekey's son, about half-a-dozen chests, and sold their contents to my friends, mostly members of the English Colony in Moscow. The tea, however, did not please my countrymen; as they were used to the weaker Chinese infusions. I therefore decided to try the wealthy Moscow grocers; but here I had even still worse luck. The majority of them would hardly look at the samples, and those who did gravely assured me that my tea was artificially scented, whilst others, who were more sensible, said that the tea was too strong for their customers. In fact, nobody would look at Ceylon tea; and I was on the point of throwing up the business, when I made the acquaintance of a very intelligent tea taster on the Moroseika St.—not far from the Kremlin. This Muscovite, who was well up in his profession, immediately recognised the splendid qualities of Ceylon tea, and ordered three or four boxes on trial. He, however, assured me that the tea was too aromatic for his customers in its pure state, and that it would be necessary to mix it with mild China tea. This he did with considerable success, and brought out a new blend, with some unpronounceable name, which could hardly be pronounced by Westerners. Thanks to the numerous advertisements I and my friend inserted in the Moscow papers, the name somehow caught the fancy of the public, and many, who would not look at the tea in its natural state, came and bought it under its new title. In fact, my friend made a large profit on the few chests he took off my hands, but, as Ceylon tea was only bought by the curious and unconservative, I did not grow fat on the proceedings. I therefore attempted to try the native tea merchants and imported still more tea, but all with poor success. Everywhere I went I was stopped by a wall of Muscovite suspicion, obstinacy and conservatism, which, with all my enthusiasm, I could not surmount. I also found it extremely difficult to sell Ceylon tea at a profit; firstly, because it was pure and unadulterated, and, secondly, because I could not afford to purchase it in large quantities.

In the course of my operations I, however, made a great many discoveries respecting the mysterious drugs of the Muscovite tea merchants, and became convinced that it would be *impossible* for an honest trader—without support—to compete with the crafty orthodox-church-going "koopzee," who were my most dangerous competitors.

I, amongst other discoveries, learned that some of them mixed their tea with "Kaporka," a kind of shrub that grows around Moscow and in appearance—but not in taste—strongly resembles the tea plant.* Other "saints," famous for their donations to the churches, smuggled

* Shortly after my departure from Moscow several of these gentlemen were arrested by the police and compelled to pay heavy fines. The majority, however, principally residing in the interior, are seldom caught.

large quantities of tea over the Polish and Persian frontiers, thus saving a portion of the high duty, which in Russia almost amounts to 2s. per lb. This practice of smuggling leads to frequent and often bloody conflicts with the Imperial frontier Customs guards. Persians and Jews frequently get killed in these encounters.

Another dodge, formerly much practised in Moscow, was for the tea merchants, *i. e.* the more unscrupulous of them, to buy up all the "leavings" from the Trakters, or teashops, to dry the same and then mix this rubbish with cheap China tea. This compound was then sold to the ignorant Moujiks for about 3s. to 3s. 6d. per lb., for which price they would in England be able to purchase genuine good unadulterated tea. The majority of the poorer classes in Russia can hardly ever afford good tea, seeing that the duty and expenses on this necessary of life is from three to four times as much as it is in England.* In consequence of the high duty, and the want of principle among many of the tea merchants, one can safely say that the poorer classes in Russia do not even know yet what good tea means. It is also difficult for the tea merchants—even when they wish to be honest—to sell their tea cheap under the conditions at present obtaining in Russia.

In the course of my frequent journeys through that country and whilst witnessing the terrible devastation caused by Vodka amongst the peasantry, I came to the conclusion that, if the Minister of Finance would increase the duty on spirits and, in proportion, diminish the present excessive duties on tea, coffee, and cocoa, he would be the indirect means of saving thousands and perhaps hundreds of thousands from death, disease and poverty—in short all those miseries that are caused by the abuse and use of spirituous drinks.

Whilst engaged in the work of introducing Ceylon Tea in "Whitestone Moscow," I had the pleasure of making the acquaintance of Sir Graeme Elphinstone, who, hearing what I was about, came all the way from Petersburg expressly to see whether business operations might not be continued on a more hopeful footing. Sir Graeme produced on me such an agreeable impression, that I should have been glad to represent him and the other planters of Ceylon, had not fate willed it otherwise. In fact, if,I remember rightly, you, as well as Sir Graeme suggested that I should accept this post of trust. But this was not to be. My health, which had been gradually undermined by an attack of inflammation of the lungs and a severe cattarrh, at last compelled me to return to London, where I remained the whole winter under medical care. During my absence from Russia the business naturally passed into other hands.

The Ceylon tea planters, apparently acting on the suggestions made by me in my early letters to the *Ceylon Observer*, decided to establish the business on a proper footing and commissioned Mr. Rogivne. Under that gentleman's able management, and with the tea planters' support, the business seems to have prospered. There are now shops engaged in selling Ceylon tea all over Russia: in Moscow, Petersburg, Vitebsk, Vilno, Odessa, Rostoff, Kharkoff and other places.

The business is, however, still in its infancy, and much hard work remains to be done. When I call to mind that about eight years ago, when I was in Moscow, the public would scarcely look at Ceylon Tea and that now several million pounds of it are annually imported into Russia, I cannot but think that there is for the high-class teas grown on your island a great future in the vast Russian Empire. That future will not however benefit my pocket: for although I conceived and commenced this business, its completion and establishment is being left in other hands. My friends in Moscow and elsewhere, who, in 1888, amused themselves at my expense for entertaining such a mad idea as the above, will now see that I was right and that on this, as well as on other occasions, I have seen far ahead of others. I have in fact been a pioneer, and, like many pioneers, have sown that others may reap.—Yours respectfully,

WILLIAM B. STEVENI.

* This practice, I am told, is still in existence.

## PLANTING OF SHADE TREES.

The following is a tabulated statement of the number of shade and fruit trees growing at the close of 1895. Shade is now given to the weary traveller along many of the most exposed roads of the country.

| Province. | Shade-giving Trees. Inga-samam. | Margosa & Suriya, &c. | Iron Bark. | Fruit Trees. Various kinds. |
|---|---|---|---|---|
| Western | 5 525 | 432 | .. | 697 |
| Central | 5,981 | 12,081 | 27,304 | 3,658 |
| Northern | 1,979 | 5,157 | .. | 463 |
| Southern | 3,750 | 7 | .. | 462 |
| Eastern | 5,966 | 110 | .. | 718 |
| North-Western | 5,000 | 41 | .. | 213 |
| North-Central | 3,463 | .. | .. | 617 |
| Uva | 5,585 | 174 | .. | 354 |
| Sabaragamuwa | 5,150 | 4 | .. | 1,509 |

—*Public Works Administration Report.*

## COST OF PRODUCTION OF TEA ON THE NILGIRIS.

(*Contributed.*)

The cost of laying down our Nilgiri Teas at the Shipping Port or on the London Market is of such importance to planters that I may perhaps be excused for addressing you at some length on the subject. In doing so I hope it will be understood that my chief object is to gain information from those whose residence and experience on these hills make their opinion of special value in this respect, while at the same time the views of a planter trained in another country and a different school may be of some benefit to them.

With reference to some recent correspondence in your journal on the subject, it would appear that the fact of most, if not all of the estates in this district packing a proportion or, in some cases, nearly all their crops, in 1 lb. or ½ lb. packets has been overlooked, their so doing increases the cost of production per lb. considerably. This does not of course interfere with the profits, provided a corresponding enhanced price is obtained for such packet teas, but the comparative cost of production with other Tea-producing countries such as Ceylon, where with very few exceptions the tea is packed in bulk in chests or half-chests, is obviously unfair. The cost of making up tea in 1 lb. lead packets with wrappers, &c., and putting same in chest, is 1 anna 6 pie per lb. above the cost of packing in the ordinary lead-lined chests in bulk. Suppose two gardens working under equal conditions and turning out say 150,000 lb. of made tea each, one of which puts half its crop in 1 lb. packets: this means that the garden so doing would have an expenditure above its neighbour of R7,000 odd, or the equivalent cost of about 9 pies per lb. over the garden packing all its crop in bulk in chests.

All things considered the Nilgiris ought to be able to hold its own with Northern India and Ceylon as regards cost per lb. of placing its tea f.o.b. Calicut

which I understand is the port the greater part, if not all, of the produce is shipped from. The Wynaad with a larger yield per acre and from the fact of that district being in a position to dispense with railway freight ought to be in a better position still as regards cheap production in the keen competition which all tea planters are undoubtedly entering upon. I am sorry we cannot congratulate ourselves on having cheap or even reasonable freights from our chief shipping port (Calicut) to the Continent, London or other important towns in the United Kingdom. Tea freights are excessive, if not exorbitant, and our Planters' Association might well address itself to getting them reduced, no easy task I admit when the apparent combination existing between coast agent and steamer lines is considered. The following figures will show under what a disadvantage the Nilgiri producer labours in this respect. The rates ruling for freight (via West Coast for transshipment at Bombay) have been for some time back and are at present as follows: to London 35/s, to Liverpool 55/s, to Continental ports 35/s per ton of 40 cubic feet, which is equivalent to about 800lb. Tea freight from Colombo to London has varied within the last six months from 12/s to 20/s per ton of 50 cubic feet, equivalent to something over 900 lb. tea, and freight from the same place to continental ports has been proportionately cheap. I cannot say what the exact rates at present from Bombay to London are, but some short time back they were as low as from Colombo; from this it will be seen that the Nilgiri producer is paying more than twice as much as his Ceylon "brother planter" for freight on tea to London and other ports. Perhaps our West Coast friends can give some explanation as to the cause of this. "Home charges," that is to say freight, landing, housing rent, fire insurance, sale expenses, brokerage, commission, interest and petties, should not exceed 1d per lb. of tea, but owing to dear freights the "Home charges" on Nilgiri tea amount to over 1½d per lb., which in these days when profits are small and the strictest economy necessary means a great deal. I have dwelt longer than I intended on the subject of freights; it is one which calls for the special attention of our Planters' Association, seriously handicapping as it does the "Tea Farmer" here. In other respects, however, he has many advantages over his brother producer in the "Spicy isle," not the least of these being cheap though perhaps not so highly trained labour. I hope on a future date (with your permission Mr. Editor) to draw some comparisons between the cost of individual works on these Hills and in Ceylon; meantime I would draw attention to the benefit arising from keeping tea estate accounts on such forms as show at a glance the cost per lb. of tea of each work, which is undoubtedly the right way of looking at it, as well as the good to be derived from comparing notes on these, and mode of manufacture, which for some unaccountable reason does not appear to be in vogue here. The age of secrets is past; it should be kept in mind that Northern India manufactures some 150 millions of lbs. of tea and Ceylon about 100 millions lbs., and that these countries have the most suitable buildings and appliances for turning it out good and cheap, whereas I think I am correct in saying that with the exception of a well-known estate in the Ouchterlony Valley, most of the gardens here are far from being "up to date" as regards their factories. From some interesting statistics lately compiled by the Hony. Secy., N. P. Association, there are said to be 6,015 acres under tea on these Hills and the working expenses on this acreage is said to be R6,01,500. Presuming this to be all in bearing and yielding say 300lbs. per acre, our total crop is 180,000lbs: and it costs to lay down f.o.b. about 5 annas per lb. These figures must be looked on as approximate, as whether the amount mentioned includes Rail and Shipping charges or only actual estate expenditure I cannot say, but even if it does not, the cost per lb. is by no means out of the way for a high district such as this, more especially when it is considered that perhaps as much as 50% of the total quantity is made up in 1 lb. packets Facts are however what we require—doubtless in some cases managers are hampered by the estates under their control being burdened with charges which correctly speaking should not go against cost of production and which prevent them turning out their tea as cheaply as might otherwise be the case. I can hardly imagine, however, that proprietors in such instances could be so inconsiderate as not to bear this in mind. I have before me the results of carefully kept statistics (the accuracy of which I can vouch for) by a Nilgiri Manager of several years' experience on a garden of nearly 100 acres, yielding 500 lb. per acre made up for his last financial year to the 30th June, which show that the crop was placed f.o.b. (all charges on this side included) for the very reasonable figure of 4 as. 9 pie per lb, 20% of the crop in question being placed in 1 lb. packets. The garden referred to is by no means favourably situated as regards transport, but has the advantage of water power for driving its machinery. The fact of tea from a compartively small acreage such as this being laid down at so low a figure goes conclusively to prove that tea planters on these Hills can hold their own with what are looked on as more favoured countries in point of cheap production, if not in high prices.

F. T. TURPIN.

—*Planting Opinion*, Aug. 15.

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## HORTICULTURAL GARDENS, LUCKNOW.

From the report on the Government Horticultural Gardens, Lucknow, for the year ending 31st March 1896, by Mr. M. Ridley, the Superintendent, we quote the following:—

I.—FRUIT CULTURE.

The mango crop was again a light one, but pineapples, which grow below the mango trees, yielded well. Peaches and *alubukharas* gave good crops; also loquats and lichis. The crop of jack-fruits was the worst I have known.

2. The orange and lime crops were light: in fact all the citron tribe yielded poor crops. One exception was a seedling orange tree of the Malta type: this bore a very fair crop of fruit, which, both in size and quality, was equal to any of the named kinds in the Garden.

*A.—Improvement of indigenous or acclimatized kinds.*

3. A small plot has been planted with forty plants of the garden variety of alubukhara, which, so far, is decidedly superior to any other variety yet tried. I hope to extend the area of this very useful fruit.

4. On a small plot of ground which was found available, 55 seedling peach trees were planted: these seedlings are from the seeds of selected fruit. Owing to injury from the flood in 1894, nearly all the seedling trees of this class which were under observation have died—several this year.

5. There is nothing requiring special record in connection with the Arabian date palms.

*B.—Introduction of new kinds.*

6. Nearly all the orange trees imported in 1887 fruited this year; with the exception of the kind named *Dulcissimo*, all yielded slightly. They were closely observed, and, when ripe, a careful comparison of the several kinds was made with each other and also with the old kinds in the Garden of the same type.

7. The following are the notes recorded:—

DULCISSIMO.—Fruits varied greatly in size, some large, some small; skin a little thicker than *Embiguo*; flavour superior, rich and sweet; and excellent orange.

DULCIS.—Slightly smaller than a common Malta; skin thinner, flavour slightly more acid.

EMBIGUO OR MARVEL.—Fruit the size of an ordinary Malta; skin medium in thickness; flavour fair.

EXCELSIOR.—Fruit somewhat smaller than the common Malta; slightly oblong, skin thinner than Malta; flesh orange yellow with a slightly acid flavour.

EGG.—Fruits variable in size, large and small; skin rather smooth and thin. Fruits have a good appearance and are also of fine flavour. This is the best orange, so far, of his batch.

LONG ORANGE.—Very like a common Malta, both in size and appearance, thickness of skin, flavour, &c.

St. Michael's.—A good-sized fruit, a little over tho common Malta in size; has a thinner skin excellent flavour; a good orange.

Silver.—Rather a small fruit; skin a pale orange colour; hence probably the name "silver." Skin thin, flesh juicy, of moderate flavour.

8. A plant of the China bitter orange bore several fruits: they were most taking to look at, being large and well-formed. When ripe they were highly charged with juice, but too bitter in flavour to be at all palatable.

9. A Japan orange, named *si-in-kom*, also fruited. It seems to be nothing else than what has been long in the garden under the name of the Mandarin orange.

10. Ten of the strongest plants of tho Malta loquats were planted out, and are, so far, doing well

11. A few years ago a packet of loquat seeds was received from California; the trees raised from this seed fruited this year. I regret to say the fruit proved to be very small and very much inferior to varieties long grown in the garden.

12. The plants of the Mauritius Ber have not made much progress, and are still being grown in pots; so many as room can be spared for will be planted out in the coming year.

13. Plants were received of the following new kinds of mangoes from the Government Agri-Horticultural Garden, Lahore:—

1. Mango Erinnura. | 2. Mango Alphonsa.
3. Mango Khusi.

14. There is still hope of establishing the strawberries imported in 1894, as plants of all are still existing in Mr. Reid's garden at Naini Tal, and also in the Muktesar Nursery, Naini Tal.

15. At Naini Tal they have not done well owing to having been planted in poor shaley soil; in a suitable soil they would no doubt do well enough. At Muktesar some fruit was obtained and efforts are now being made to increase the stock of plants.

II.—Vegetable and Farm Culture.

20. The usual selection of country vegetables was grown for the purpose of yielding seed.

21. The hot-weather section did well, with the exception of "kakri" (*cucumis melo var utilissimus*), the fruits of which suffered severely from disease, which attacked and destroyed them when at a mature stage of growth.

22. Imported vegetables were also grown as in preceding years: pears did moderately well only, the excessively dry atmosphere which prevailed all through the cold weather was most unfavourable to this crop. Carrots were to a large extent a failure, owing to the seed germinating badly. With these exceptions, the results obtained with other vegetables were satisfactory.

23. As early vegetables are usually in request by the general public, it may be stated that Sutton's earliest cabbage proved itself the earliest out of the undermentioned kinds by fully two weeks: all were sown at the same time and received identical treatment afterwards:—

Cabbage, Sutton's Imperial.
,, Wheeler's Imperial.
,, Sutton's All Heart.
,, Sutton's Earliest.

24. Through the kind offices of Dr. Bonavia, I received a large packet of onion seed from Egypt, but I am sorry to say none of it germinated. In forwarding the seed Dr. Bonavia expressed the opinion that it was probably the same variety (silver-skin) which has been so long cultivated in this Garden. It is matter for regret that this could not be ascertained.

25. The non-success of previous years has again been repeated this, in the attempt made to raise sugarcane from seed. The repeated sowings made all ended in blank failures. The plantation made in 1893 having exhausted the soil and got into an unsatisfactory condition, a new one has been made of the same kinds.

26. The Japanese fodder plant, *Polygonum sachalinense*, has so far proved a failure, the plants got sickly in the rains and died down to the ground before the cold weather set in: growth commenced again in February, and the plants have a few weakly stems upon them now. The appearance of the plants afford no ground for thinking that this plant will be of any use as a forage-producer in a climate like Lucknow.

27. Two consignments of Rum plant (*Strobilanthes flaccidifolius*) were received from the Assistant Director; the plants in tho first consignment all died, but from the second lot eleven are alive; nine plants in the ground under lichi trees, and the other two in pots. They are only a few inches high and not vigorous, but appear healthy and afford some hope of succeeding.

28. Sufficient seed has been secured of the Italian grams mentioned in last year's report at paragraph 42 to admit of a sowing being made of each on a scale large enough to afford a fair test of the outturns they are capable of yielding. This I hope to carry out next year.

29. The plants, or rather roots, raised last year of "canaigre" survived the hot weather and rains underground, and started into vigorous leaf growth as soon as the cold weather arrived. They were much stronger and more robust than last year, and again have seeded freely.

30. From the seed secured last year a number of young plants were raised and planted out on a plot measuring 63 square yards; this contains 259 plants; they have done well and give promise of a good yield of roots: it has been considered advisable to let them have a second year's growth before testing the yield.

31. Anyone wishing to experiment with this plant can be supplied with seed for the purpose. So far as the trial with it here has extended, there is good ground for thinking that it can be successfully grown in this climate.

32. The clover seed sent by the Assistant Director was sown in the horticultural garden on good, well-cultivated soil. The seed was sound and germinated satisfactorily, but proved to be largely mixed with "kasni" (*Cichorium intybus*) the proportion of clover plants in the crop appeared to be about one-fourth of the whole.

33. Both plants reached full growth early in April, when the entire crop was cut; it was weighed at once while green. The total weight was 7¼ maunds, or at the rate of 95½ maunds per acre.

34. Comparing this with lucerne, which is said to yield 3¾ tons or 8,400 lb. per acre at one cutting, the yield of this clover and "kasni" crop is less by 589½ lb. per acre. The season was not very favourable; but, after making due allowance on that account, it may still be safely assumed that lucerne would give a higher yield, and I should certainly think lucerne vastly superior in nutritive qualities.

35. There is nothing in this experiment to justify the belief that such a crop can be usefully grown for fodder in this part of India.

36. A plot of ground partly vacant and partly planted with Eucalyptus trees has been cleared, levelled, and made available for the cold weather crops: this will give some relief, as often difficulty was experienced in finding space for crops of annuals and vegetables. The area made available is 3,133 square yards.

IV.—Arboriculture.

53. The demand for Eucalyptus leaves was nearly the same as last year. Forty-seven maunds of leaves were sent out during the year against 37 maunds last year.

54. The effects of the flood of September 1894 are gradually disappearing: and as no damage was done by flood-water this year, the young stocks of trees have had nothing to impede their growth.

55. As shown in column 4 of the following statment, distribution during the year was very small; this is due to the want of trees of a size large enough to plant out not being available, owing to the destruction of all trees of a useful size by the flood of 1894. This year trees of several kinds are available, so that I anticipate a larger issue during the coming year.

56. The trees enumerated as missing in column 5 were chiefly overgrown trees which had become too large to transplant, so were uprooted to clear the space they occupied.

57. Attention is given to raise only such number of each kind as are likely to be required each year: on this

account, the increase for the year is not so large as it might easily have been. As nearly as can be estimated, there will be (barring loss by flood) sufficient for all demands in the future.

58. The total number of trees in stock at the end of the year is more than double what it was at the end of last year.

59. The ground unoccupied by nursery was cropped with oats: the grain-yield was fairly good, but the straw was short, due to the excessively dry atmosphere which prevailed all through the growing period.

EXOTIC PLANTATION.

63. The following additions have been made to the trees previously under trial in the Exotic Plantation: *Tecomo serratifolia*, four trees; *Manihot glaziovii*, six trees.

64. The blanks caused by the flood among those previously planted have all been filled up except in the case of *Aleurites molluccana*, of which no plants are yet available.

65. The plantation of Divi-Divi remains very much in the condition it was last year. One of two things should be done; either to reduce the plot to the three good rows on the west side where the trees are doing well under the shade of the rain trees, or to plant some quick-growing tree among the others to afford them shade. It is quite clear that they thrive best with a certain amount of shade and shelter from tall trees.

66. The rain trees are in better condition this year; the dryer state of the air and soil, which has obtained since September, appears to have benefited the trees. A small supply of seed is now obtained yearly from the largest trees.

DATE PLANTATION.

69. There has been a loss of 100 in the number of date trees previously planted, and as the young trees on hand were considered too small and weak to plant out no blanks were filled up this year. The number of trees now planted out and living is 700.

70. A few look healthy and are growing slowly; but the majority are not doing well, as previously explained: this is chiefly due to the shade caused by the Eucalyptus trees among which they are planted.

71. The Eucalyptus trees are in a fairly satisfactory condition, and give promise of developing into useful building poles in time.

72. The trip of vacant ground bordering the public road on the east side was planted up during the year. The soil in several places is heavy and hard, and on these spots the young trees have died out in large numbers. The result of this year's planting is 5,000 young trees added to the plantation.

73. There is a small blank on the west side planted some years ago, on which only a few trees survive: this has been trenched and a stock of seedlings is being raised to replant it this year. When this is done, the planting will be completed, so far as eucalyptus trees are concerned; the available area will then be filled up: all that will remain to be done will be to fill up the blanks among the date-palms.

## INDIA AND GREEN TEA.

To the question of the advisability of reviving the green tea trade in India a most interesting contribution has been made by Mr. Ringler Thomson, British Vice-Consul for Khorasan, in a report upon the trade of that region which has just been published under the auspices of the Government of India. In his report for 1894-95 Mr. Thomson touched upon the subject of Indian trade with Persia and Central Asia, and referred to the prohibitive tariffs with which it had to reckon. The present report deals with 1895-96, and the Vice-Consul takes special notice of the tea trade, showing the relative positions of India and China in this part of the world, and endeavouring to assign a reason for the change which has come over them during the last twenty years. It certainly seems strange, as Mr. Thomson remarks, that "while Indian black tea has been steadily driving the Chinese article out of most of the far-distant markets of the world, Chinese green tea, in a short space of time, and apparently without an effort, drove the Indian article clean out of its own market."

How completely this has been done is manifest from the statement that whereas twenty years ago the whole of the green tea trade with Khorasan was in the hands of British Indian tea planters, to-day they "do not supply a leaf." It must be admitted that on this point Vice-Consul Thomson's observations are not borne out by those of the Collector of Customs, Bombay. That official describes green tea as the most important branch of the trade between Bombay and the Russian possessions in Central Asia, all Chinese tea being, of course, in the first place shipped to Bombay, and thence re-exported. Comparing the quantity thus dealt with during the last five years with that exported from India to Persia the Bombay Collector of Customs shows that the quantities of Indian tea varied considerably from year to year, but that in 1894-95 they reached a total of over two million pounds, while the Chinese article was placed upon the same markets to the extent of nearly four million pounds. In the first nine months of 1895-96 there was, according to the Collector of Customs, a large falling-off in the trade between China and Persia, and a corresponding increase in the export of Indian tea. The totals were: China tea 1,193,090lb.; Indian tea 3,750,685lbs. India also did well, during the period mentioned, by the new Batum route, exporting 121,771lbs. in 1895-96 as against nil the previous year. The Collector of Customs concludes, therefore, that Indian tea has benefited, and that China tea has suffered by the new Custo regulations enforced by the Russian authorities. Vice-Consul Thomson differs from him. He maintains that if the Collector's figures are accepted they amount to saying that India alone is now supplying Central Asia annually with more green tea than that district formerly received from India and China together. Mr. Thomson considers this highly improbable, and adduces the evidence of British planters at Kangra and Kumaun and of Messrs. Balmer Lawrie and Co., to show that "no green tea is manufactured by Europeans in Northern India and only little by Natives." How is this discrepancy between Mr. Thomson's figures and the Collector's to be explained? Mr. Thomson has a convenient method of accounting for it. He points out that the Collector has said a great deal about green tea and about other exports to the Gulf, but that he nowhere makes mention of *black* tea. "Therefore I imagine," writes the Vice-Consul, "he has mixed his Indian teas, and has included black with green, which would account for the error." Large quantities of tea go to Bandar Abbas, a million and-a-half pounds being taken by Bushire alone. That is how the Vice-Consul gets rid of the difficulty. It would be interesting to hear what the Collector has to say on the subject. Going back over the history of the transfer to China from India of this important trade Mr. Thomson says that two things happened simultaneously: trade left the Afghan route and China absorbed it. The writer does not attempt to connect the two events, because, as he says, while he is able to explain the reason of the first, he is still doubtful about the causes of the second.

As to the avoidance of the Afghan route that was brought about partly by the heavy import duties levied by the present Amir, and partly by reason of the unsafe, because unsettled, condition of the country at the time of his accession. All independent merchants forsook it, of course, and it would have fallen into complete desuetude but for the compulsion put upon Afghan merchants to carry on their business along the routes of Afghanistan. These facts are sufficient to account for the diversion of the traffic to the Gulf, but obviously they throw no light on the concurrent transference of the trade in green tea from Indian to Chinese hands. Mr. Thomson suggests as a possible explanation that prices had been falling in Northern India for some time and that the European planters at last refused to go any lower, and turned their attention to black tea. About the same period, he supposes, "some enterprising China or Bombay merchant read the signs of the times and began to place the Chinese article on the Bombay market for despatch *via* Meshed." This a charming theory, the parts of which dove-

tail into each other with perfect ease. We wonder what the Bombay Collector of Customs thinks of it. Mr. Thomson, it is interesting to learn, finds that prices are now good again, and thinks it possible that Indian planters may come to renew their interest in the green leaf. There is, he says, a British Consul at Batum, and there are several respectable merchants of various nationalities there who would be delighted to act as agents. The country, too, is being opened up by the new railways which are in course of construction. There would be some consolation in the engineering activity of the Russian Government, if its policy of piling Pelion upon Ossa in the matter of railways should result in facilitating the development of a British Indian industry.—*Englishman*, Aug. 11.

## FOREST WEALTH OF BRAZIL.

An interesting report on the forests of Brazil has recently been presented to his Government by the French Consul at San Paulo, who calls attention to the wealth of timber in them, more particularly in the forests situated in his own consular district. M. Georges Ritt says that among the sources of natural wealth in the province of San Paulo, one of the most interesting, but unfortunately, somewhat neglected, is the timber of which the immense virgin forests are composed. The recent industrial exhibition at Rio de Janeiro, where a considerable number of samples of Brazilian wood were on view, was the means of calling attention to the value of these products and to the advantages to be derived from a regular and systematic working of the forests. The most important, as well as the most common, tree is the *pinho*, which is found in great abundance in the State of Parana also, and where it is known as the *araucaria*. In San Paulo the *pinho* has been sacrificed to coffee cultivation, and a large number of these trees have been destroyed, and the forests themselves burnt in order that the land might be prepared for the coffee plants. The *pinho* is, nevertheless, still found in great profusion in the western and southern parts of the province. The tree grows easily and rapidly, and attains a height of 45 metres. In twenty years it can supply large planks, which are used for sleepers, doors, and windows, axletrees, etc. After the *pinho* or *araucaria*, the acacia which is known by the Indians as *curupay*, is one of the most useful woods of San Paulo. This wood is particularly hard and able to withstand the effects of the weather. It is used for carriage building, and for making drays and the rough carts of the country. The acacia is also employed in ship building and in making railway sleepers. This tree attains a height of from 12 to 15 metres, but it is of slow growth. Much interest is devoted to this tree, not only on account of the usefulness of its timber, but also because its leaves are said to have some medicinal property similar to that of the eucalyptus. Another interesting variety is the *guajuvira* (*Patagonula Americana*), a tree which is found growing throughout the whole of Southern Brazil. The wood is very hard and durable. It is eminently adapted to carriage making, and also furniture and other articles; it is also used for railway sleepers; it grows to a height of about 12 metres. The *soita cavallo*, or *aconta cavallo*, is a wood of very good quality, it is hard and not easily split. It is used for yokes, *sabots*, and broom handles. It also serves for piano making, and is used for furniture, and one establishment on Santa Maria the *aconta-cavallo* is specially used for making chairs. In addition to the above-mentioned trees which are the most common, and the most generally used, there is a large number of other varieties which although not worked, might be so with advantage and profit. There are the following:—*Cabreuva ipê huma, canjerana, tajuba, jacaranda, figueira branca* (white fig tree); *arocira, sucupira, pereira, batalha, canella, passaruiva, cedra, carroba, canna fristu, suinam*, and others. The *cachoraen* and the *pas de Brazil*, which are found in great profusion in the forests, are much appreciated by dyers for the beautiful red colour yielded by the bark. An idea may be formed, by the above enumeration, of the abundance and variety of useful trees in the province of San Paulo. Unfortunately, as M. Georges Ritt observes, everything in Brazil is sacrificed to the coffee industry, all other productions only appearing to be of secondary interest. Sylviculture has always been neglected, and this to such an extent that in the neighbourhood of cultivated districts a large number of forests have been ruthlessly destroyed, to make way for coffee plantations. The consequence of this is the increasing rareness of indigenous woods on the market, and their high price. Moreover, it necessitates, in spite of the natural resources of the country, a considerable importation of foreign timber, particularly from Sweden and Norway and California, these importations being required for building purposes. These foreign timbers, notwithstanding the distance from which they are brought are placed on the market in Brazil at a cheaper rate than the Brazilian woods themselves. One explanation of this is that the high price of Brazilian wood is caused by the difficulty and cost of transport in the interior of the province. The majority of the railway companies only serve the coffee districts; in fact, it was in view of this industry that they were originally established, and it is, therefore, perhaps only natural that at certain periods, more particularly during the coffee harvest, the companies devote all their energies to its transport, which is a lucrative one for them, and that the carriage of timber is neglected, stocks of which are allowed to accumulate and to remain for long periods exposed to the inclemency of the weather and to the risk of robbery, which is by no means infrequent. It is owing to these disadvantages, and the insufficiency of the means of transport, that the owners of the forests have been induced to destroy their property rather than to saddle themselves with heavy expenses which they could not recoup themselves for, by a rapid sale of their products. Moreover in San Paulo, although there are many streams and waterways, the advantages enjoyed in other countries in the way of floating the timber to its destination are not available, the streams in question flow towards the western part of the province (the basin of the Parana), which is the sparsely-populated district, all the towns and the centres of industry and activity being situated in the elevated regions of the interior, and at the source of the rivers. The virgin forests being found in the lower plains of the West, it is impossible to utilise the stream for floating the timber to the places where it could be delivered for consumption. In conclusion, M. Ritt says that unless the Government takes steps to put an end to the difficulties which hedge round the timber industry in Brazil, the time must soon come when an industry which could easily be made an inexhaustible source of wealth to the country will entirely cease to exist.—*Journal of the Society of Arts*, July 31.

## FACTS ABOUT TEA MAKING AND WATER.

*(By a Professional Analyst.)*

It used to be a common thing with our grandmothers to put a little soda in the teapot when making the daily "brew," and the custom is still pretty widely existent. This practice of water-softening was not without its justification in the days when China teas alone were imported; but at the present time, with Indian and Ceylon teas in such preponderance, some discrimination is desirable in suiting the water to tea, or the tea to the water, as the case may be. Ordinary potable water contains small quantities of organic matter, and much larger but very variable amounts of inorganic bodies: the latter it is which determine whether a water is "hard" or "soft." Practically the "hardness" of a water is the only thing to be considered in regard to its tea-making properties; the organic matter, though of the first importance in judging of the fitness of the water for drinking, is usually altogether too minute to effect the quality of the tea infusion. With the hardness, however, the case is different. A tea suitable for soft-water infusions will give a different result when made with hard water.

Broadly speaking, the substances extracted from tea by the water, are—(1) the alkaloid theine, to which the chief stimulant and refreshing effects of the tea are due ; (2) the oil of tea, which confers much of the characteristic fragrance and aroma ; (3) the tannin, imparting astringency and bitterness and acting prejudicially on the digestive system ; and (4 tho residual extractive matter, including albuminons and other compounds which help to impart "body," flavour and colour to the infusion. Physiologically the theine is the most important constituent, and either hard or soft water extracts it almost equally well if sufficient time be allowed, though soft water appears to act more readily at first. Roughly, about 50 per cent. of the total theine is obtained in the beverage as ordinarily made, or perhaps a little more. It may be asked whether much of the remaining 50 per cent. cannot be extracted. By further "drawing" this is quite possible, but the amount of tannin is also increased, so in practice we have to effect a compromise. With respect to the oil of tea, little is definitely known as regards the comparative efficacy of hard and soft waters. This is to be regretted, since much of the flavour and "bouquet" depends on the constituent in question. Appreciably more tannin is dissolved out by soft water than by hard, at all events from some kinds of tea. Many laboratory determinations made with distilled (perfectly soft) water have shown that tho amount of tannin extracted depends on the time of infusion, considerably more being present after ten minutes than after five ; but experiments made by Geisler indicate that with moderately hard water the increase is much less than with soft water. The proportion of residual extractive matter is also affected by the hardness of the water. A soft water will extract more albuminoids than one which is hard ; and, in fact brewers, who are aware of this general property, make a point of using hard water for clear ales, but a soft one for thick porters. Which, then, should one use—a hard or a soft water? It depends upon the kind of tea. Indian teas, being of rough and pungent flavour, are better made with hard water ; soft water yields a stronger but less agreeable infusion. China teas, on the other hand, are more suited to localities where tho water is soft ; their more delicate flavour allows of the fuller extraction given by the soft water, without the beverage becoming unpalatable. Frequently, however, as will be known to many readers of *The Grocer*, China teas are blended with Assam or Indian teas in different proportions to suit the water of a particular district ; for instances, Glasgow, supplied by the very soft water of Loch Katrine, would require a large proportion of China to Assam than would, say, Birmingham, where the water is hard. Ceylons and Darjeelings are of an intermediate character, and are suited to moderately hard waters.

It is, of course, usually easier to choose the tea to suit the water than *vice versa* ; but if we desire to drink, say, a delicate China tea and have only a very hard water supply, we may soften the water in a rough-and-ready manner by the old-fashioned device of putting in a little soda. On the other hand, a water that is too soft for Indian teas could be hardened by the addition of a small quantity of calcium sulphate, but practically it is better to blend tho tea in this case. Waters that have a large proportion of "temporary" hardness can be considerably softened by half an hour's boiling ; but it is an article of faith with tea-tasters that water, whether hard or soft, should not be thus boiled—the tea should be made immediately ebullition commences. There is a consensus of opinion on this point, though the scientific reasons are not well known. Probably the small quantity of dissolved gases still remaining in the water, but which would be expelled by continued boiling, have an aerating effect on the beverage, or possibly some constituent of the tea may be more completely oxidised. Waters naturally alkaline, or made so with a slight excess of soda, give a more nutritious infusion than ordinary water, since they extract the gluten of the tea. In Europe, where tea is only valued as a stimulant this is a matter of merely theoretical interest ; but in Thibet the fact is particularly applied in preparing a kind o food, which is said to be very nourishing. Waters containing iron in solution should be avoided. Iron and tannin together form ink, which does not improve the flavour or colour of the decoction.—*Grocer.*

## WANARAJAH TEA COMPANY, LIMITED.

The fourth ordinary general meeting of the shareholders of the Wanarajah Tea Company of Ceylon, Limited, was held in the office of the agents and secretaries (Messrs. Baker & Hall), Queen Street, today. Mr. T. Mackie presided, and present were Messrs. A. Cantlay, J. W. Vanderstraaten, T. W. Hall, F. W. Burt, and (by proxy) H. L. Baker and E. S. Anderson.

Notice calling the meeting, which was published in the *Gazette*, was read, and minutes of the ordinary general meeting held on August 30th, 1895, were read and confirmed.

The CHAIRMAN submitted the report, which is in the following terms :—

ACREAGE.

| | | | |
|---|---|---|---|
| Tea in bearing .. | acres 541 | | |
| ,, planted 1892 .. | ,, 300 | | |
| ,, ,, 1893 .. | ,, 124 | | |
| ,, ,, 1895 .. | ,, 72 | | |
| | —— | | 1,037 |
| Timber and Grass .. | | acres | 57 |
| Jungle .. .. | | ,, | 40 |
| | | | 1,134 |

The directors have pleasure in submitting to the shareholders their report, balance sheet, and profit and loss account for the past season. The coffee crop, as anticipated in last year's report, proved a very small one, only 99 bushels 1st parchment, 6 bushels 2nd, and 40¾ bushels cherry. The season has been a favourable one for tea, and the yield has reached 238,761 lb., against an estimate of 170,000 lb. The average nett price realized for the teas, sold to date, has been a little over 62 cents per lb.

In last year's account the tea in store and balances on unsold shipments were estimated at R9,006·37. These realized R11,684·85, and the surplus has been included in this year's proceeds of crop.

During the year, 205 acres were manured, with very satisfactory results ; and the directors propose to continue their policy of a liberal outlay on this work. The reserve set aside to provide for manuring has been exhausted, and the additional expenditure has been charged to working expenses. This will be continued in each year.

The ordinary working of the estates shows a balance at credit of profit and loss account of R105,383·91. Of this sum an interim dividend of 8 per cent was paid in January last, and the directors now suggest that a final dividend of 12 per cent be paid, making a total of 20 per cent for the year, and that the balance of R28,271·91 be carried forward.

The estimate for season 1896-97 is 290,000 lb. Tea, and 200 or 300 bushels Coffee may be secured ; but the Directors do not anticipate any material increase to the receipts from this product in the future.

The expenditure on Capital Account for the present year is estimated at some Rs. 24,000, which includes additional machinery and withering accommodation and new lines.

Special attention will be given to planting up ravines, etc., which will materially add to the appearance and value of the property. It is proposed to plant 13 acres of this land this year, and the balance next year. The Visiting Agent reports very favourably on the general condition of the estate, and his report can be seen by Shareholders at the Company's Office.

The Directors who retire by rotation, Messrs. Thomas Mackie and E. S. Anderson, being eligible, offer themselves for re-election.

Mr. Guthrie, the Auditor, also offers himself for re-election.

The Chairman, in moving the adoption of the report, congratulated the shareholders on the satisfactory footing of the Company. He presumed that the report might be taken as read, having been in the hands of the shareholders for some time. The outturn for the season under review confirmed the remarks made by the Chairman at the meeting held a year ago, resulting in some 68,000 lb. in excess of the estimate. As illustrating the progressive increase of yield, the following figures might be of interest to the shareholders:

| | | |
|---|---|---|
| Crops for | 1892-3 .. .. | 53,995 lb. |
| ,, ,, | 1893-4 .. .. | 86,657 do |
| ,, ,, | 1894-5 .. .. | 117,697 do |
| ,, ,, | 1895-6 .. .. | 238,761 do |

and for the current season the estimate is 290,000 lb. He regretted to say that so far as coffee was concerned no material help could be expected in the future, and before long this heading would cease to exist in the books of the Company. The young fields of tea planted on forestland were most promising, and, being of a superior jât, would doubtless, when in full bearing, give most satisfactory results and add materially to the prosperity of the Company by increasing the yield as well as improving the quality. For further details the Chairman placed the visiting agent's last report on the table to be at the disposal of shareholders.

Having invited discussion, those present remarked that the full information afforded left nothing to inquire about, and the adoption of the report having been seconded by Mr. H. L. Baker was carried unanimously.

On the motion of the Chairman, seconded by Mr. F. W. Burt, it was resolved that a dividend of 12 per cent be paid forthwith, making 20 per cent for the year.

Proposed by Mr. J. W. Vanderstraaten, seconded by Mr. T. W. Hall, that Messrs. Thomas Mackie and E. S. Anderson be re-elected Directors.—Agreed.

Proposed by Mr. H. L. Baker, seconded by Mr. F. W. Burt, that Mr. John Guthrie be re-elected Auditor at a fee of R100 per annum. —Agreed.

The Chairman having spoken in commendation of the able services of the manager and his staff in bringing about such favourable results, the meeting unanimously recorded its appreciation of their services.

A vote of thanks to the Chairman and Directors closed the proceedings.

## INDIARUBBER AND BANANAS IN MEXICO.

Sir Henry Dering, in his report on the productions of Mexico (already referred to) describes the cultivation of India-rubber and bananas. The rubber tree is indigenous to Mexico and is found growing wild along both coasts, below 22 degrees north latitude, from sea level to altitudes running from 1,200 to 1,500 feet, and principally by the river meadows. Rubber is essentially a tropical tree, hence it requires a hot and moist climate. The temperature best adapted for its vigorous growth is above 96° Fahrenheit, and the rainfall should be at least 60 to 70 inches per annum. There are eight kinds of rubber trees that grow wild in the country, but the kind known under the name of "Castilloa elastica" is the most important and the best, as it is very much sought for, for its sap and for propagation. Regarding the work of extracting the rubber one man will tap from 20 to 25 trees a day if the operation is performed carefully and methodically. In most places the tapping is done in May and sometimes again in October, but it is not advisable to repeat the operation as often as that. The process generally consists in making two or three incisions in the lower part of the tree and collecting the sap that flows from them on clay vessels placed next to the trunk. The process can be repeated every year for 25 years or more especially if the wound is covered with wax or clay after the flow of the sap has ceased. When there is a large quantity of milk gathered it is placed in a barrel having a faucet and a solution of five ounces of chloride or sub-carbonate of sodium in sufficient water to cover the whole mass, which is agitated with a stick every now and then. After lapse of 24 to 36 hours the water is allowed to run out through the faucet; this operation of washing is carried on until the rubber becomes white. About 44 per cent of rubber remains from the original amount of milk after the water and other matters have been eliminated by evaporation. Trees planted on lands having the soil, climate, and elevation adapted for the culture will produce from 5 to 6 lb of juice on the first year that they are tapped, which amount is equivalent to 2·4 lb of pure rubber. This product will be gradually increased every year for the next four or five years, and sell 50 cents per lb on the plantation. The total expense for a rubber plantation of 100,000 trees will not exceed 25,000 dollars, and as the yield of 100,000 trees will be about 240,000 lb at the first year's harvest, this will bring the planter 120,000 dollars, besides the product obtained from the side planting. The net profit on the investment, after deducting the entire cost of the land and all expenses up to the first year of harvesting, will be 95,000 dollars, and each of the succeeding harvests for 25 or 30 years will bring a steady income of over 100,000 dollars.

The Banana grows spontaneously and in very great abundance almost everywhere on the Mexican coast region and on the lower borders of the temperate zone. The plant is cultivated in all the States, excepting in the Distrito Federal, Baja California, Sonora, Coahuila, Chihuahua, Agréas Calientes, Mexico, Tlaxcala, and Campeche. Its cultivation is easy and cheap, and when properly carried out, the first crop may be gathered in ten or twelve months from the time of planting. As to the expenses, large plantations can be made at a cost of 3½ to 5 cents per plant, if planted 1,000 to the acre. The cost of clearing the ground is from six to eight dollars per acre; the price of 1,000 suckers or shoots from 2 to 25 dollars; staking, holing, and transplanting will cost 8 dollars 25 cents per 1,000 dollars; weeding and trimming, 6 dollars 25 cents per acre; and gathering the fruit, 6 dollars 25 cents per acre. At the end of the first year, 1,000 plants will yield 1,000 bunches, which sell at the plantation at 25 cents a piece, producing 250 dollars. The following year the yield is double that amount, and the expenses less than half.—*Journal of the Society of Arts*, July 24.

Confected Tobacco.—At present a duty of R130 and R60 per candy is imposed on dry and confected tobacco, respectively, imported from Tinnevelly into Travancore. The Travancore Durbar has now found that, says a Madras contemporary, this procedure is an inducement for fraud and invasion of duty, as the importers have established a confecting factory at Panagudi, in British territory, near the frontier of the State where the dry tobacco is subjected to a show of confection and the imperfectly confected tobacco is brought into the Native State and passed off for purposes of duty as fully confected stuff by hood-winking or buying off the Customs and Bankshall authorities. This has resulted in a considerable fall in the quantity of dry tobacco imported and to a consequent loss of revenue to the State. In order to check this the Madras Government has accepted the proposal of the Travancore Durbar to impose a uniform duty of R90 per candy on all Tinnevelly tobacco imported into that State.

## GOVERNMENT BOTANIC GARDENS, NILGIRIS.

From the annual Administration Report of the Government Botanical Gardens and Parks, Nilgiris, for the year ending 31st March 1896, by Mr. David Hooper, Government Quinologist, we make the following extracts:—

NOTES ON PLANTS OF ECONOMIC INTEREST—(1) *Ipecacuanha.*—The cultivation of *Ipecacuanha* does not succeed so well at Nilambur as was at first anticipated. Out of 249 plants put out in 1887, only 149 were alive last June; but they were flowering fairly well and were in a healthy condition. It seems that they require a moister climate than Nilambur, for they die down annually during the dry months between January and May, and sprout up afresh at the first burst of the monsoon. Mr. Malcolm in the Vellara Mulla Hills has discovered that a light shade under fig trees and a moist situation are more suitable for the plant than thick forest shade. Some young plants have been sent to applicants in the untried districts of Peermaad, Travancore and Coorg, and reports upon their progress have been promised.

A few flowering specimens of *Ipecacuanha* are being sent from India to London to have their botanical features investigated. A dozen plants were sent to Kew about a year ago, and reached their destination in good condition.

(2) *Jalap.*—Five hundred pounds of jalap tubers from a stock of lb. 1,200 were supplied last January to the Medical Storekeeper, Bombay, and the balance of lb. 700 will be divided between the Medical Stores of Bombay and Madras, as application has again been made for the drug this year. A large order for jalap from Calcutta could not be complied with, as the present crop is not mature enough for lifting. For some years past the whole of the jalap has been grown in the Cinchona Plantations at Dodabetta, and it is intended this month to plant it out also on the terraces above the glass houses in the gardens.

The private planters on the Nilgiris are still holding back from cultivating this useful drug, and are not able to place any of it on the market.

(3) *Dandelion* (*Taraxacum Officinale*).—The crop of Dandelion near Crewe Hall has not been taken up yet, as the roots have not grown much during the dry weather, and are still very thin. After another wet season it is hoped that the plants will be sufficiently robust to yield a large quantity of matured roots.

(4) *Sweet flag* (*Acorus Calamus*).—The sample of oil distilled from the fresh plant and sent to Surgeon-Major Parker of the Medical Stores, Bombay, for experiment, was tried by him, but he reports that the results of its clinical administration were not satisfactory. The fresh root is no doubt the best part of the plant for medical purposes.

(5) *Digitalis.*—In February last the Medical Stores Department, Bombay, asked to be supplied with lb. 30 of these leaves, which were sent there and charged for at the rate of As. 4 a pound.

(6) *Nilgiri Nettle* (*Girardinia palmata*).—The Reporter on Economic Products, on behalf of the Imperial Institute, has been making enquiries regarding a fibre suitable for the manufacture of hats. A specimen of the Nilgiri Nettle fibre, prepared by Mr. McIvor in 1867, was forwarded through the Board of Revenue, and enquiry was made as to the cost at which a similar material could be supplied. A small quantity of the fibre, about half a pound, was prepared from some of the nettles in the Government gardens at the cost of R3. The Nilgiri Nettle is not so plentiful in the neighbourhood of Ootacamund as it used to be, and the Todas, around whose munds it is generally found, do not appear to utilise the fibre.

(7) *Litsaea Zeylanica.*—The Litsaeas grow in profusion on these hills, and the trees are related to the cinnamon. The Reporter on Economic Products, through the Board of Revenue, applied for some of the essential oil of the leaves for the Imperial Institute. The oil exists in the leaves in a minute proportion which made the process of distillation very tedious. The oil possesses the peculiar fragrance of the tree, but it has the remarkable property of resinifying or drying up like a varnish when exposed for a short time to the air.

(8) *Indian Madder* (*Rubia cordifolia*).—In December 1894, some roots of this plant collected at Naduvattam were sent to the Reporter on Economic Products at Calcutta, and in March last another consignment followed of the roots taken when the plants were in their fruiting stage. The authorities at the Imperial Institute wish to determine the difference between the varieties of this plant established in the Khasa Hills, Sikkim and the Nilgiris. The botanical characters are very slight, but it is considered that the quality and quantity of the colouring matter of the root vary according to local or climatic conditions. The *Rubia cordifolia* on these hills is a straggling shrub with long wiry stems penetrating the jungle for a great distance, which makes it a difficult matter to dig out the root.

(9) *Camphor tree* (*Cinnamomum Camphora*).—A certain amount of interest was shown last year in the introduced camphor trees of Ceylon, and a discussion was raised as to the value of the leaves and twigs in affording camphor compared with the stem and root. As the question could only be settled by actual experiment, the leaves from trees grown on this plateau were examined and the results published in a paper entitled *Camphor Leaf Oil.* The leaves from trees growing in the Government gardens yielded an oil containing about 15 per cent of camphor, and some oil distilled from the leaves of trees growing at Naduvattam, at an altitude of 6,000 feet, contained 50 per cent. of camphor.

(10) *Wild coffee* (*Diplospora sphærocarpa*).—This plant has again been sent by two planters on the Nilgiris for identification. It belongs to the same natural order as the true coffee, and bears a round fruit containing *flattened* seeds which at once distinguished it from its allies. Colonel Kenney-Herbert, in 1890, made an infusion of the roasted seeds prepared from this plant in the Quinologist's laboratory, and he pronounced it to be very palatable and similar to, but slightly weaker than, that made from ordinary coffee.

(11) *Sequoia sempervirens.*—A young tree of this species was planted last July by His Excellency Lord Wenlock above the Tennis courts near Government House and is now in a thriving condition. This is a Californian plant which yields the redwood of the timber trade, and, in its native climate, attains vast dimensions. The tree has been raised from seed in the Government gardens with some other conifers from North America, but the one planted by Lord Wenlock was presented by Mr. A. Lascelles.

(12) *Adhatoda Vasica.*—In 1888 a chemical examination of this plant was made by the writer and the active principle was found to be an alkaloid named "vasicine." Experiments were made with the plant and its alkaloid, and it was proved that the lower forms of animal and vegetable life were killed when brought into contact with the solutions. At the suggestion of Dr. Lauder Brunton, F.R.S., the dried leaves of the plant were sent last year to Professor Giacosa of Turin for investigation; he found them to be rich in nitrate of potash but failed to find an alkaloid. As these results were conflicting, fresh samples of adhatoda leaves were obtained from Madras, Calcutta and Punjab, and the enquiry was renewed in the laboratory. The existence of an alkaloid in all specimens was proved, and a sample of acetate of vasicine in a crystalline condition and soluble in water, was sent for exhibition to the Indian Museum in Calcutta.

(13) *Eucalyptus species.*—A number of specimens of eucalyptus leaves were sent for identification, but it was impossible to determine the species from the leaves only. Flowering and fruiting specimens should always be sent if plants are to be satisfactorily named. A few enquiries were made with regard to the boiler fluid manufactured from blue gum leaves; but the correspondents were referred to eucalyptus oil distillers in the neighbourhood.

(14) *Datura Stramonium.*—A quantity of the roots of this poisonous plant collected on the hills was sent to Bombay for the purpose of testing the activity

and comparing it with that of the root of *Atropa Belladonna*, with which it is allied. The Medical Storekeeper of Bombay has prepared a liniment, alcoholic extract, tincture and plaster from the roots, but he is not at present able to report on their therapeutic value, as the clinical experiments are not finished.

(15) *Nongana pulloo.* The Assistant Surgeon of Cannanore forwarded in March to this office a weed called "Nongana pulloo." It was said to be used by the people of North Malabar as a remedy for elephantiasis, and as a substitute for tobacco. It was indentified as *Fimbristylis æstivalis*, a small plant belonging to the rush family (Cyperaceæ).

(16) *Polygonum Sachalinense.*—The plants of this fodder, which were raised from seed obtained by this office from Japan and mentioned in the last year's report, have nearly all died; so the results of this experiment may be said to be a failure.

(17) *Sandalwood* (*Santalum album*).—Some billets of sandalwood were sent by the Forest Department for the purpose of determining the difference in the amount of essential oil yielded by two kinds known as "male" and "female" sandal. A third specimen received at the same time, afrom a tre grown in the plains, gave a most remrkable resulte in not yielding a trace of volatile oil and being without odour.

(18) *Indian Dock* (*Rumex nepalensis*).—In the cinchona report of last year reference was made to the Indian Dock, and the probable presence in it of chrysophanic acid. Dr. O. Hesse of Stuttgart has kindly examined some root sent from the Nilgiris, and found in it three colouring principles—

1. Golden yellow spangles melting at 186deg., with a composition expressed by the formula $C_{15}H_{16}O_4$.

2. Orange red needles, melting at 136deg., with a composition of $C_{17}H_{14}O_4$.

3. Greenish-yellow prisms, melting at 158deg., and composed of $C_{18}H_{16}O_4$.

The first of these substances is an insomer of chrysophanic acid and may prove to be useful on some future occasion in medicine and the arts.

(19) *Trees suitable for introduction as an experiment on the Nilgiris.*- In paragraph 3 of G O., No. 5046, Revenue, dated the 11th December 1895, Government desired the submission of a general list of trees which were considered most suitable for experiment with a view to acclimatization on these hills; and also called for another list of such trees as have been proved by experiment to flourish here, and would likely to be of value if introduced on a larger scale. These lists have been drawn up and submitted to Government.

## THE COFFEE POT.

The planters assembled in conclave at Bangalore have been discussing a very interesting question, namely, the why and the wherefore of the decrease of the consumption of coffee in Great Britain, and they would seem very reasonably to have found one cause of the thing in the fact that the making of coffee is an art that the *chef* of the English household seems unable to get round. The making of tea is a simple art. *Recipe:* Let the water be on the genuine boil; warm the pot; put in the tea, pour on the water, " and we do the rest." The making of coffee, however, like the making of salad, is a real art, and it is not everyone, even though provided with the best coffee-pot in the world, that will turn out a good honest cup of coffee such as shall verily cheer. A cup of coffee supplied by citizen D'Angelis or by any other of the "makers" is one thing, and a muddy infusion of the berry that some of our "boys" dare to dish up as *cahfee* is altogether another; and it is assuredly this ignorance of the right way to make coffee that has a great deal to do with inducing people to prefer the homely tea. A cup of coffee in the early morning is a particularly good tonic. In the early morning it produces a highly exhilarating and refreshing effect, and the infusion of the berry is generally recommended as a more appropriate matutinal pick-me-up than an infusion of the leaf; and it was not by mere chance that the coffee-pot became the recognised appendage of the British breakfast table along with the eggs and the rolls, and that "coffee and oppers" still hold morning sway with the Madrassi crowd. It would undoubtedly be an excellent idea for coffee planters, for the sake of their own interests, as well as for the public good, to give the public a few general hints as to the proper method of brewing the berry. Tea-planters have done it, not only in the shape of Siegel-like "directions" on pound packets, but in the *propria persona* of dainty tea-making damsels at colonial shows.

Another of the why's and wherefore's has been rightly found in the rapid decline of the price of tea. Tea and coffee started pretty fair and square in the race. Tea, indeed, is said to have been drunk in China as long ago as the 5th century; but it was not till the 16th century that it became known to Europeans. Coffee was not drunk by the Arabs themselves, as far as is known, until the fifteenth century, but, as with tea, it was first introduced to Europeans in the sixteenth. But then came the rub. Tea was for a long time regard as a medicine, while coffee began to be used as a beverage from the beginning, and the consequence was that tea, like any other drug, remained a costly thing, while coffee became cheap. Old Samuel Pepys relates that the "pothicary" had recommended the use of tea to his wife as beneficial for cold and for feminine complaints. Locke, the philosopher, on returning from a trip to the continent, counts it worth recording that he had brought back a pound of tea, which, for the low price of seven guineas, he had purchased in Amsterdam. In the numerous coffee-houses, however, that rapidly sprang up in London and in all continental cities, cups of coffee were of small expense, and the colonial planters supplied the berry in as large quantities as were wanted; whereas it was not till the end of the seventeenth century and the beginning of the eighteenth that we find tea being indulged in as an aid to social small talk, as at that memorable tea-party in 1811 at Hampton Court, where

. . . thou, Great Anna, whom three realms obey,
Dost sometimes counsel take—and sometimes Tea.

The price of tea in 1657 ranged as high as ten guineas per pound; in 1710, by which time the drinking of tea had become fairly common, the price ranged from 7s to 24s a pound. Exactly a century afterwards, in 1840, Indian tea offered for public sale in London fetched no more than from 2s 6d to 3s per pound. Since then things have rushed. Great advertisers like Lipton have stormed the market, missionaries have gone abroad preaching the gospel of tea, and offering it, if not without price, at least very near it, and it is small wonder that homely housewives, who can buy the refreshing beverage cheaply, can make it easily, and can use the tea-leaves afterwards for cleaning the floors of their sitting-rooms or their kitchens, have gone over from coffee to the sister drink. There is perhaps another reason that applies especially to Indian housewives, namely, that tea is ready for use, and the housewife can dole it out straight from her caddy into the pot. Coffee, however, has to be manipulated. It can be bought, to be sure, ready ground and roasted, but the fulness of the flavour in that case is liable to have gone out of it. Between buying the berries and handing them over to the servant to be roasted and ground the housewife, if she looks upon her servants as pilferers, is prone to believe that the prepared powder is not by any means the sum total of the berries.

But it is pushing and advertising that the coffee planters assuredly need. Tea planters have recognised that in this great advertising age they must wag with the rest of the world, and their campaigns have proved a success. Coffee planters have been inclined to think that they have done enough when they have grown a good article and put it on the market, and waited for customers. But the present competitive age demands something more. A coffee campaign, on lines such as might be deemed most fitting, might assuredly go a long way towards restoring coffee to its rights at the British breakfast-table, and if popular "directions" could really be given for making coffee after a duly approved

fashion there are no doubt very many who would be converted to preferring the juice of the berry to the juice of the leaf.—*M. Times*, Aug. 21.

## THE DECLINE OF COFFEE.

### EXTRAORDINARY ACTION BY THE GOVERNMENT.

### ALLEGED OFFICIAL PATRONAGE OF FRAUD.

We all know that coffee as a beverage has been declining in popularity in England for the last five and twenty years. The quantity of coffee now consumed here is less than half that which was drunk in 1873, but the price is probably twice as much now as it was then. You cannot buy a pure coffee in this country for less than 1s. 2d. a lb., and even then it is of very poor quality as a beverage. Tea, on the other hand, has fallen in price to an enormous extent. When fine coffee could be had at a shilling a pound fine tea cost four shillings; now coffee has enhanced its value, and the average price paid per pound for tea, even by the fairly well-to-do classes, is not eighteenpence. Tea is more than ever a national beverage; coffee is a receding quantity, chiefly, as the experts will tell you, because we hardly know how to make it in England. For the matter of that, we hardly know how to make a well-seeming tea, but that is another story.

Years ago, when tea was even more a luxury than now, the coffee-growers of the hot climes regarded London as their market or clearing house for the world. They mortgaged their crops to London houses in consideration of advances given, and shipped the coffee to London to their order as return for the money. In those days they would not deal with any other than a London house. But, by and by as commercial credit became established in other countries, a draft on a Dutch or a French house grew to be as acceptable as that on a London establishment, and worth just as much. Then the growers, began to dally with other traders, London lost its monopolist position, and the coffee naturally gravitated in large part to the ports nearest to the area of consumption. Holland, for instance, got the greater part of its coffee to its own ports; France did likewise; and though the coffee consumed in England naturally came to our ports, that which England used to export dwindled in quantity before the direct consignments to the Continent.

The English traders then began to find that they suffered through their own honesty—don't smile, that honesty was compulsory! The foreigners had no scruple in packing inferior samples in the casks or bags bearing the marks of much more valuable brands; and putting them on the market at vastly enhanced rates and at great profits to themselves. Their Governments made no effort to stop this fraud; in fact, I daresay, a bland official smile at the discomfiture of English is still its reward. But in England it was difficult to do this successfully in the free warehouse. and quite impossible in bond—up to a short time ago. True, even well-known firms have been suspected of palming other marks of coffee on their customers as brands of fine quality, but only when they themselves had cleared them from bond. If the customer himself went to the trouble of effecting the clearance he knew that the coffee he obtained was exactly that which had been cleared from the ship according to the warrants. To buy coffee from bond was a guarantee of true description and quality, until the Government made an order, a month or two ago, by which it practically becomes the patron of fraud, and lends its warehouses to the swindling of the public.

I ought to explain several things about the coffee trade before I go further. Coffee comes into the market from many sources. There is the Mocha coffee, the taste for which is probably, in most cases, acquired, because there is a peculiar rank flavour about the beverage, which does not commend itself to everyone. Then there is the Mysore coffee, which gives a rich, thick liquor, as though you had infused too much of it; and the Jamaica, very thin in liquor, but very fragrant; and the Costa Rica coffees, very plentiful and fine in quality; and the Ceylon coffees, declining in quantity every year, owing to the devastations of the leaf disease or blight, from which the Costa Ricas are yet free; and the Guatemala and other Central American growths, as well as large quantities of Brazil coffees and several others. Hardly any coffee of these countries could be sold direct for consumption, except, perhaps, Costa Ricas; they have all marked characteristics, but very few indeed have, of themselves, precisely the desirable flavour or quality. It is the duty of the expert coffee blender to take a coffee with one characteristic, another with a quality lacking in the first, and another with a flavour yet lacking in the other two, and mix them all together to get the properly fragrant blend which the coffee drinker likes. The coffee blender in large houses acts upon his knowledge acquired by long study of coffees, But the grocer who sells coffee generally makes his own blend according to a more or less fixed formula; he may send out the two or three bags of each sort he buys to be ground, but probably he makes his popular blend of a portion of Plantation Ceylon coffee, so much Jamaica, and so much Costa.

Plantation Ceylon coffee comes over here in large casks weighing 10 or 12 cwts.; but it is now a scarce commodity, and the price is accordingly greatly enhanced; Jamaica is imported in barrels of about 2 cwts., is more plentiful than the other, and accordingly is cheaper—though it must not be forgotten that Jamaica is considered to be the finest coffee grown, and a choice lot will always bring a big price: the scarcity of Ceylon alone makes it dearer. Costa Rica, having complete freedom from disease, grows many fine coffees, quite as good as Jamaicas in many cases, quite as skillfully grown, and as well cured, but owing to the plenitude of the supply, the price of Costa Ricas may be some 16s. less per cwt. than Jamaicas. These marks will suffice for illustration. There are tricks in all trades, and there are some in the coffee trade. It is a profitable trick, for instance, to sell Costa Ricas as plantation; and it has been done. Coffee has been shipped from Costa Rica to Ceylon, in its "parchment," or husky stage, cleaned in Ceylon, and prepared for market, packed in Ceylon casks, and shipped to England and sold as "Plantation" coffee. It paid to take all that trouble and cost to secure the enhanced price. Again, the Jamaica coffee berry has a very delicate bloom, which, might almost, it seems, be rubbed off by a touch of the finger; the Costa Ricans have invented a method of drying their coffee seeds which produces an exact imitation of the Jamaica bloom, so that even an expert may often be deceived by a sample of coffee thus faked, unless he is able to trace the cargo to the port of issue. This is done to get the higher price for Jamaica coffee. There are other ways of faking, such as that practised abroad, of dyeing the berries with indigo to give them the blue hue which is indicative of the "London cleaned" coffee, but we must let this pass with the explanation that the London cleaned coffee has not the same quantity of water dried out of it as coffee clean abroad, and when polished has a deeper colour consequent on the moisture left in, The point is that by trickery even experts may be deceived; and that by false marks, without any faking, the non-expert grocer may be done again and again in his purchases.

The Government was besought some time ago by the coffee merchants and exporters in London to give them concessions which would put them on a level footing with foreigners in their trickery. The Government consented, as the following order relative to the bulking and mixing of coffee and cocoa, printed in the "Public Ledger" shows. The order is dated May 15 last from the Custom House, and amends the existing regulations thus:—

"Coffee or Cocoa, whether from the same or different countries, or of the same or different importations, may be bulked or mixed for home consumption, exportation, or ships' stores, on condition that

the original marks be obliterated. The remarking of the packages may be carried out in accordance with the wishes of the parties concerned.

"That in cases in which packages belonging to a particular consignment of Coffee or Cocoa are improted by different vessels at reasonable interva's, the original and the subsequent consignment may be operated upon together without applicaton to the Board, under the following arrangements, viz.:—

"That, on request to the Surveyor of the station at which the Coffee or Cocoa is to be warehoused, the bringing to account of the first and subsequent consignments may be deferred until the arrival of the quantity necessary to complete the parcel, when the whole may be weighed and bulked, the weights being brought into one account in the same manner as if the whole had actually arrived by the vessel which brought the original consignment."

This is to say, the holders of coffee in bond may manipulate as they like to suit the market, under Government protection. Already, I am assured by experts, casks of good marks are worth money, for they may be taken into bonded warehouses in London—not as yet in Liverpool—filled with a mixture, or with some cheaper Costa Rican brand, and sent out as Plantation Ceylon or Jamaica. The Costa Rica substitute may, as coffee, be as good as the Jamaica it purports to be, but the regulation will permit a merchant to palm off a coffee worth 16s a cwt. less in the market, and to defraud the buyer of that sum. It is as though you had some cheap, though passable cigars in bond, and the Government permitted you to take in 1,000 boxes of a popular and dearer brand, fill them with the cheaper cigars, and send them out as a grand new consignment of Murias, say, just cleared from bond. If the faking or mixing be done in bond, the original marks must be destroyed; but any other mark may be used, and obviously, whatever the other mark be, it cannot accurately describe the contents of the package. This not only opens the way to the palming of cheaper coffees for dearer ones upon larger dealers; but it makes it quite easy to foist upon the man who buys a small parcel a very inferior coffee, deliberately prepared under lying marks to deceive him. Thus the retailer is likely to suffer, and through him the consumer—who drinks enough poor coffee as it is—that the large export houses may be in a position to manipulate, fake, and cheat as easily as their foreign rivals. The "bought from bond" phrase will be a mere deception, for Government has deliberately shut its eyes and opened its warehouse to possible fraud. It is a very disgraceful policy, it throws principle to the winds, it may involve the Government in connivance in many a swindle, and destroys the value of the security of bond.

Thus we have had a glimpse into some of the secrets of the coffee trade, which, I think, is interesting, and we have seen the great English Government, reputed for honesty at least in some things, willingly making itself a partner in a scheme to meet foreign trickery with home made trickery. Some M. P. with a desire to be useful ought to take a few moments of the time of this wearisome session to make some pointed inquiries on this matter.—*Manchester Sunday Chronicle*, July 26.

## INDIAN TEA SHARES.

A great deal of interest is being taken just now in the shares of Indian tea companies, and it behoves us in the interests of the investing public to give some little attention to the matter, especially as there is some probability of a lot of rubbish being foisted on the market. It is no secret that whenever the investing public want a new kind of investment the promoting world is always ready to supply them, and at such times it is necessary to be very careful in making a selection. We give below a table of what may be regarded as the best companies at the present time, taking into consideration the quotations of their shares. It will be found that we have excluded several well-known concerns, for no other reason than that either their shares are difficult to get, or that they have been raised to such a level as to make it impolitic to buy them. For instance, the Dooars Company may be regarded as the very doyen of the business, yet it can scarcely be denied that the shares are as high as they should be. Of course, the Ordinary shares return about 6 per cent. on the money, but these, we believe, are scarcely obtainable. If they can be got they are good enough to keep. The Preferences yield something less than 4 per cent. Among the Ceylon companies there is greater scarcity, and possibly the very best concerns are quite beyond the reach of the investing public. The following list of companies, with their capitals, may be regarded as including those concerns whose shares are not too high, and in which there is a fairly free market:

| | | Capital. |
|---|---|---|
| | | £ |
| Assam | .. | 187,160 |
| Chargola | .. | 153,010 |
| Darjeeling | .. | 135,420 |
| Doom Dooma | .. | 149,270 |
| Jokai | .. | 300,000 |
| Jorehaut | .. | 100,000 |
| Lebong | .. | 65,656 |
| Lungla | .. | 200,000 |
| Jhanzi | .. | 83,500 |
| Scottish Assam | .. | 79,590 |
| Ceylon Tea Plantation | .. | 248,460 |

The following table gives a list of what may be regarded as the best and relatively cheapest Tea shares at the present time, which are for the most part preferable to those new issues which are of the nature of blind pools. The prices that are given are those which should not be exceeded by purchasers, and if the shares cannot be got at these figures, then they had better be left alone:—

| | | At not over |
|---|---|---|
| Assam | .. | 59 |
| British Indian | .. | $4\frac{3}{8}$ |
| Cachar and Dooars | .. | 12 |
| Doomes | .. | 18 |
| Jorehaut | .. | 57 |
| Lungla Ordinary | .. | 12 |
| Scottish Assam | .. | $10\frac{1}{2}$ |
| Chargola | .. | £1 |
| Majuli | .. | 8 |
| Chargola Pref. | .. | 30s |
| Lungla Prefs. | .. | $13\frac{1}{2}$ |
| Assam Mortgage Prefs. | .. | $13\frac{1}{2}$ |
| Dumbula Valley Prefs. | .. | $6\frac{1}{4}$ |

If the investing public, with a weakness for tea shares, will confine themselves to the securities that we have mentioned, they will not go far wrong.—*Bullionist*, July 2.

## THE EILA TEA COMPANY OF CEYLON LIMITED.

An ordinary general meeting of this Company was held on the 29th Aug. at noon in the office of Messrs. J. M. Robertson & Co., agents and secretaries. Mr. Henry Bois presided, and present were:—Messrs. W. E. Mitchell, F. Liesching, J. M. Mason, and Gordon Bois (Secretary), and Mr. A. E. Scovell (as a visitor).

The Secretary read notice calling the meeting and minutes of last half-yearly meeting, which latter were confirmed.

THE ANNUAL REPORT

is as follows:—

The Directors have the pleasure to submit their Report and Accounts for the year ending 30th June, 1896.

The crop on Eila Estate has slightly exceeded the estimate, but the Crop from Kanangama was a little under that estimated. The total crops from the two Estates amounted to 358,066 lb. against an estimate of 360,000 lb.

The price realized for the Tea was not altogether satisfactory and the net average of the Tea sold from the two Estates was 37·97 cts. against 42·83 cts. last year.

The Net profit for the year, after allowing R6,100·49 for depreciation, is R44,657·11 (equal to nearly 15 per cent on the Capital of the Company) to which must be added the balance brought forward (after payment of the dividend for 1894–95) of R2,095·13 together aggregating R46,752·24.

Out of this an interim dividend of 4 per cent has been paid leaving R34,752·24 available for distribution.

The Directors recommend that this be disposed of as follows, viz :

| | |
|---|---|
| That a final dividend of 9 per cent be declared on the share Capital of R300,000, making 13 per cent for the year .. .. .. | R27,000 00 |
| That a sum be carried to Reserve Fund of .. .. .. | 6,000 00 |
| Leaving to be carried forward to next account .. .. | 1,752 24 |
| | R34,752 24 |

The Estates on the 30th June, 1896, consisted of—

| | | |
|---|---|---|
| Eila | 410 | acres Tea, 5 years old and upwards |
| | 50 | ,, ,, 2 ,, ,, ,, ,, |
| | 105 | ,, ,, 1 ,, ,, ,, ,, |
| | 62 | ,, ,, under 1 year |
| | 330 | ,, ,, Forest. |
| | 957 | |
| Kanangama | 200 | acres Tea 5 years old and upwards |
| | 15 | ,, ,, 4 years old |
| | 108 | ,, ,, Forest |
| | 323 | |

Mr. H. Tarrant retires in accordance with the Articles of Association, but being eligible offers himself for re-election.

The shareholders will also have to elect an Auditor for Session 1896–97

By order of the Board of Directors,

J. M. ROBERTSON & Co., Agents & Secretaries.

Colombo, 13th August, 1896.

The CHAIRMAN, in submitting the annual report of the Directors for the season ending 30th June, said as it had been in the hands of the shareholders for some time, he concluded it might be taken as read. The Directors regretted the falling-off in the average price of the tea, which was very considerable, and, seeing that one cent per lb. on the price of the tea made a difference of no less than one and a fifth per cent on the capital of the Company it was all-important that the average should be kept as high as possible. Up to the end of the year, that was the half year from June to December, the average was a very good one, but unfortunately a large proportion of the Company's tea came into the second period of the season from January to June, when the prices of tea were very low. The Directors had given careful attention to this and were doing all in their power to prevent such a low average in future. The Kanangama tea was of a low quality, but they were inclined to think that the Eila tea ought not to come into the ruck of low teas and they hoped, if possible in future, that they would be able to prevent it. Notwithstanding this falling -off in the average, which made a difference of nearly 6 per cent on the dividend, he thought they might consider that the Company had done fairly well. Regarding the crops they came out very nearly to the estimate. The Kanangama estimate was 150,000 lb. and, notwithstanding that a small acreage had to be cut down unexpectedly owing to helopeltis, the result was 146,000 lb.; or only 4,000 lb. below the estimate. He might mention there was very little helopeltis to be seen now and that a small amount was provided each year for catching the insect, and he thought it had been kept down very well. Mr. Dawkin was in the office that morning and had said that there was very little indeed noticeable and that the yield for the last two months had been very satisfactory. The Eila crop was slightly over the estimate, which was 210,000 lb., and everything was going on satisfactorily on the estates. They were in good order and the estimated crop for the coming year was favourable. He moved the adoption of the report and accounts.

Unanimously adopted.

On the motion of Mr. MITCHELL, seconded by Mr. LIESCHING, a dividend of 9 per cent was declared for the half-year.

The CHAIRMAN said the next thing was to elect a Director in place of Mr. Tarrant. Mr. Tarrant retired last year, but the articles of association provided that the director longest in office should retire. This happened to be Mr. Tarrant, so that therefore he again retired.

Mr. LIESCHING proposed the re-election of Mr. Tarrant.

Mr. MASON seconded. Agreed.

The CHAIRMAN intimated that Mr. SHATTOCK, the auditor, had gone home, and in the meantime the directors had thought it advisable to elect Mr. John Guthrie, and he trusted this would have the approval of the shareholders.

On the motion of Mr. MASON, seconded by Mr. MITCHELL, Mr. Guthrie was elected auditor at the usual fee of R50.

This was all the business.

## THE RHONDURA VALLEY TEA COMPANY OF CEYLON.

An extraordinary meeting of the shareholders of this Company was held at noon on the 31st Aug. in the office of the agents and secretaries, Messrs. J. M. Robertson & Co. Mr. A. E. Scovell the Chairman presided, and present were Mr. F. W. Bois, Mr. W. Moir and Mr. Henry Bois *per* Mr. H. G. Bois. The meeting resolved to purchase 666 acres of land from Mr. Scovell, and the Directors were empowered to raise the necessary capital for this purpose. The land in question is situated above the cart-road, and practically connects the Company's estates, Broadlands and Rhondura, which abut on the cart-road. The land is in jungle and steps will be taken without delay to have it cleared and planted in tea. A wire shoot will be constructed forthwith at a point on the cart-road down to the factory on Broadlands. By it leaf plucked on Rhondura and on the extended portion of the Company's land when it comes into bearing will be sent to the factory.

## THE INDIAN TEA CROP.

The unusual dryness of the present year throughout the spring and early autumn was known to have told seriously against the tea crop all over north-eastern India, in Assam, Cachar, the Dooars and Darjeeling. The unfavourable character of the season is brought out by the figures of the export trade, for the July clearances from Calcutta only amounted to 24 million lb as against 28¾ million lb. in 1895, and nearly 26 millions lb. in 1894. The weather, however, improved in the tea districts as the season advanced, and it is to be hoped that by the end of October it will be found that the later months have made up some of the earlier deficiency.—*Madras Mail.*

## MARAGOGIPE COFFEE: A QUERY.

A planter asks:—"Does Maragogipe coffee grow in Ceylon, and is there a market for same in London?" Perhaps some of our readers will be able to give full details. We have seen the seed advertised for sale in Ceylon.

## FORESTS IN INDIA AND THEIR REVENUE.

A short time back we drew attention to the handsome surplus accruing to the State from forests in the year 1895-96, and the comparative figures may now be given in detail. The provinces under the control of the Government of India, Madras and Bombay being excluded, yielded the following surplus during the quinquennial periods mentioned:—

| | | |
|---|---|---|
| 1870-71 to 1874-75 | ... | Rs. 11,12,000 |
| 1875-76 to 1879-80 | ... | ,, 17,18,000 |
| 1880-81 to 1884-85 | ... | ,, 23,86,000 |
| 1885-86 to 1889-90 | ... | ,, 38,42,000 |
| 1890-91 to 1894-95 | ... | ,, 53,51,000 |

In the year which has just passed the surplus was Rs. 58,41,000. Madras and Bombay may be taken as giving at least 22 lakhs, so we have a net surplus for all India and Burma of about 80 lakhs of rupees. In years to come it will doubtless rise to a crore, for Upper Burma has by no means reached its limit of production, and as the country is opened out the revenue must expand. The Forest Officers, to whose energy and ability this development is due, as a whole lead hard lives, with a good deal of exposure and a good deal of solitude, often in unhealthy climates. But even if their lines were all cast in as pleasant places as those of the lucky few, it would be no reason for meanly wriggling out of a concession that has publicly been granted and announced.

## A NEW INDUSTRY FOR INDIA: RHEA FIBRE AND DRUGS.

The remarkable development of the Rhea fibre throws for the moment all tariff differences between Bombay and Manchester into the shade. The Indian Government has long been aware that in this widely spread variety of the nettle family its provinces possess a source of unused wealth. In 1869 it offered a reward of £5,000 for the invention of a machine or process which should separate the delicate fibre from the bark at a cost consistent with the requirements of commerce. An offer of R50,000 was renewed in 1877. Various machines were submitted under these inducements, but they failed in regard to the essential element of cheapness, and after many trials the offers were withdrawn. The effectually attracted, however, the attention of experts in Great Britain, Europe, and America. Rhea became recognized as one of the most valuable fibres known to the ancient or modern world. Its use in Egypt, India, and China dates from before the dawn of history. Rhea cloth is unrolled from the mummies of the Nile and unearthed in the burial mounds of Assam. The nets and lines spun from it had, for strength, fineness, and durability, no riv ls among the fishermen of Bengal and the Malay Archipelago. As "China grass" it won its way about the beginning of this century into European commerce.

The difficulty is to separate the strong silky fibres of the bark from the outer cuticle and the tenacious gums in which they lie embedded. In the past, when labour was of little account, the wives or daughters of the husbandmen and fishing communities scraped and washed small quantities of the bark till, by the persistent toil of many days, each family produced a few handfuls of the much-prized fibre. But the cost of this manual process proved an insuperable difficulty in the adoption of Rhea for modern textile manufactures. Dr. Royle, as industrial adviser to the India Office, showed that the Rhea fibres "are exceeded by none in fineness, excel all others in strength, and may be fitly compared to the trunk of an elephant which can pick up a needle or root up a tree." He declared that, if the difficulty of separating the fibre can be overcome, "the benefits to India and the world will be incalculable." It is this problem that the chemists and machinists of Europe and America have during the past 30 years been endeavouring to solve. France and Germany at once entered the field with factories for the extraction of the fibre. They worked it up into many forms, from ropes and sail canvas to plushes and dress-pieces resembling silk goods in appearance. They failed, however, to produce a filasse, or clean fibre, which should be at once cheap and serviceable. No machine or merely mechanical operation eliminated the resins with a perfection which yielded fine yarns, except at a cost prohibitive of their general use.

The chemists seemed for a time to be more successful. They produced by means of various reagents a filasse which was at once cheap and apparently sound. Beautiful fabrics were woven on the Continent, and the inventors laid out a large capital, in the belief that they had solved the problem. But by the time the fabrics came into the hands of the consumers, indeed often before they passed from the shops of the retail dealers, it was found that the chemicals had injured the fibre, and the goods were often returned to the makers. Process after process and machine after machine failed to extract a Rhea fibre which should be both durable and cheap.

The honour of solving the problem has fallen to an English chemist, born, we believe, in India. Mr. Gomess after many experiments elaborated a process which the Indian Government is at length able to pronounce a complete success. "The difficulties which previously existed," says the official memorandum lately issued by its Inspector-General of Forests, "in regard to the extraction of the valuable textile fibre from the bark of the Rhea plants have been entirely overcome by what is known as the Gomess process, and a large demand has sprung up for ribbons of dried bark with every probability of its increasing to enormous proportions." After referring to the operations of the Rhea Fibre Treatment Company in London and its dependent associations now being established throughout India, Europe, and America, the official memorandum proceeds to indicate how the production of the fibre may be increased in practically unlimited quantities to meet the demand. "These facts seem to point to the conclusion that we are on the dawn of an industry which even promises to rival jute cultivation." The Inspector-General then draws out a scheme for aiding the cultivators by official information as to the areas most suitable for the growth of the plant and the varieties best adapted to each locality, and by Government experiments as to the best modes of stripping, drying, and baling the bark. The subject, he insists, "becomes all the more important and urgent as reports reach us from the French colonies of considerable activity in the Rhea fibre trade, and as it would not be convenient to be outstripped by them."

The Gomess process adopts zincate of soda for the elimination of the resins, and effects it without the slightest injury to the fibre. After the "ribbons" or strips of bark have been freed from dirt they are placed in weak acid baths for a night. Next morning they are passed through a mild alkaline bath, and then boiled in weak solutions of caustic soda to which zinc has been added. When washed and dried by the usual mechanical means the fibres emerge as a long, silky filasse, entirely free from the cuticle and resinous gums in which they were embedded; clean, white and ready for the comb of the spinner. They take the most beautiful dyes and can be worked into every variety of fabric from gorgeous velvets to cheap drills and delicate laces. The combined lightness and toughness of the fibre render it peculiarly suitable for tents and ship canvas. Three-fifths more cloth of equal strength can be made from Rhea than from the same weight of linen. That is to say, 1,000 yards of the Rhea canvas weigh only as much as 600 yards of linen. Its durability and resisting power to strain are also much greater. The Government of India is taking effectual steps for the rapid extension of the cultivation. If its forecast be correct, we may congratulate ourselves that what promises to become a great new industry has been rendered possible by the science of an English chemist and has been practically inaugurated by an English company.

Of scarcely less importance to India is the development of its indigenous drugs. If the Gomess process is the invention of a chemist honourably connected by family ties with India, the exploitation of the indigenous drugs has been chiefly the work of an Indian native chemist. Professor Kanai Lal Dey, of the Calcutta University, and formerly chemical examiner to the Government, has just issued an enlarged edition of his treatise on the medicinal products of British India. It brings to completion the researches of Ainslie in 1826, of O'Shaugnessy in 1844, and of Waring in 1868. It supplements them with a wealth of practical knowledge which could only have been accumulated by a chemist who has passed his life in the country, and who is intimately conversant with the languages, the customs, and the requirements of the people. British physicians in India are aware of the vast possibilities lying around them in the shape of native drugs. The Governor-General in Council lately issued a resolution with a view to more fully utilizing the indigenous medicines, and pointing out the difficulties in the way. What it demands are drugs of a stable character, free from adulteration, and at a price not exceeding that at which they can be imported. Professor Dey's work will form a landmark in the accomplishment of this object. Nor should the labours of Mr. T. N. Mukharji, F.L.S., lately of the Imperial Museum, Calcutta, be forgotten. His accurate work, painstaking attention to details, and admirable equipment of the international exhibitions in Great Britain and Europe have slowly but surely compelled recognition of the medicinal remedies used for ages by the East. At one time it seemed as if our Indian Universities were only to produce lawyers and literary men. They are now producing men of research, whose work takes a distinguished position in the scientific journals and libraries of Europe. They are also disclosing, in no small measure, that rarer quality by which men of science bring their labours to bear on the wants and the welfare of their own country. Rapid as has been the growth of Indian vernacular literature under British rule, the progress of India science and technical knowledge, represensented by investigators like Professor K. L. Dey and Mr. T. N. Mukharji, is perhaps even more striking.—London *Times*, Aug. 10.

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## PLANTING AND PRODUCE.

LI HUNG CHANG AND THE CHINA TEA TRADE.—In the list of presents which Li Hung Chang distributes during his Western pilgrimage chests of choice China tea are conspicuous. The Chinese Chancellor would like to see life restored to the China tea trade, and it would be very agreeable to him if he could help to give it a fillip.

CHINA TEA AND THE LIKIN DUTIES.—Indian and Ceylon tea planters are not particularly anxious that the restrictions which handicap the tea trade of China should be removed, but it is interesting to know how these restrictions affect the tea trade of China. Mr. Allen, the British Consul at Fuchau, in his last report on the trade of that port, says that "an obstacle to the dovelopment of commerce in China, less easily remedied than bad roads, is a faulty, not to say an utterly rotten and corrupt system of collecting revenue, wherein the vested interests involved are so enormons that nothing short of the reform of the whole fiscal arrangements of China can set it right. Although the evils of this system are patent everywhere in the empire, there are two places where they are seen in their most aggravated form. One is Canton, the other Fuchau. The system of farming the taxes, or at least making the official in charge of them remit a certain sum every year, while he puts the balance into his own pocket, insures the largest possible collection at the greatest possible cost and the least possible benefit to the Government. It is said that the cost of collecting likin is 70 per cent of the total sum realised. The tax farmers are not low class pariahs like the publicans of Judea. On the contrary, a tax farmer may be, and often is, a mandarin of the highest rank. In Fuchau there are four separate establishments levying taxes on merchandise, each one competing with the others, and looking on the revenue collected by them as a loss to itself. The Maritime Custom House levies duties on all goods imported or exported in foreign bottoms or in Chinese steamers. These press lightly on trade, except in the case of tea, which pays 2·50 taels a picul, which in 1858 was supposed to represent an *ad valorem* duty of 5 per cent. This, then, makes the average value of tea 50 taels per picul. It is now only 15 taels, so that the proportion of duty has risen from 5 per cent. to 16½ per cent. Indian and Ceylon teas pay no export duties, so that this impost alone is enough to handicap the China trade."

A SUGGESTION.—We publish a letter from a correspondent, who writes, apropos the Assam and the Surma Valley dinners, suggesting that an annual gathering of Indian tea planters, comprising all districts, be held in London. The Assam dinner was instituted as a gathering of planters and their friends from Assam, including Cachar and Sylhet. Whether its scope could be widened so as to take in Indian tea planters generally is a point for the committee to decide. We agree with our correspondent that a thoroughly representative Indian tea planters' annual dinner is very desirable if it can be managed. Each district could, if it wished, have a dinner on its own account, but an annual meeting of planters representing all the tea districts in India would prove impressive, lend additional importance to the tea industry generally, and also promote a feeling of good-fellowship between all districts. There may be serious difficulties in the way of carrying it out, but the suggestion is worth the consideration of those immediately concerned.

THE STANDARD OF QUALITY IN COFFEE.—Someone has suggested that "holders of coffee in bond may manipulate as they like to suit the market under Government protection." This has brought the *Grocer* on the track of the author of the statement, and leads our contemporary to say that state-

ment is "totally untrue." It remarks that "it is an invariable rule with the Customs authorities at the port of London not to permit the bulking or mixing of coffee excepting it is done under their own supervision, and even the privilege of 'roasting,' when it is conceded, is extended to only one individual firm, who have a special license for the same. As to "a merchant palming off a coffee worth 16s per cwt. less in the market' than the description the buyer supposes he is receiving, with the intention of 'defrauding him of that sum," it is sheer nonsense to say so. The fullest particulars of the parcels in public sales are printed in the brokers' catalogues, and when the wholesale dealers, as purchasers, are experts in judging of the value of the article, such gross frauds and deceptions are impossible. Moreover, the retailers who follow the market pretty closely know well enough that there is a vast difference between the qualities of coffee at 80s and 96s or 90s and 106s, and they could not by any kind of manipulation, even if there were attempts to practise it, be deceived in the lots they buy. A uniform standard of quality in coffee is most difficult to maintain, as the same growths do not arrive regularly all the year round, but only at certain seasons, and there are few articles of commerce so cramped in supply as coffee. Since the production in Ceylon has fallen from 1,000,000 cwt. in 1870 to a mere trifle, the imports of colonry sorts suitable for home consumption have been seriously reduced and are very precarious, coming at various intervals from Central America, when not obtainable from older ports of shipment. Thus business between the wholesale dealers and the retailers is rendered extremely awkward in times of scarcity. Hence the high prices paid for desirable qualities year after year. Even the plentifulness of Brazil coffee has been of little or no avail, as it is not exactly the sort that is required for domestic use in this country; and Santos—a superior description of Brazil which has been tried as the nearest substitute for plantation coffee when the latter has not been procurable —has been given up as a failure by connoisseurs in the art of making a truly delicious cup of coffee. Experienced judges in "The Lane" have been heard to say that the rarest kind of coffee is a blend of Cannon's Mysore or other choice East India, colonry plantation Ceylon, and rich old yellow Mocha; or a combination of mountain-grown Jamaica and bright blue Costa Rica. But how are these favourite descriptions to be obtained in requisite abundance to keep the trade going steadily on throughout the season? That is the question; and here begins the supreme difficulty of getting really fine coffee always unmixed, and without one distinct class being used instead of another, as the closest approach to the style and quality wanted by the fanciful consumer. In seeking to supply what is required no fraudulent practice is intended. Dealers simply endeavour to suit purchasers of coffee as nearly as they possibly can during periods of dearth."—*H. and C. Mail*, Aug. 14.

## STRAITS SETTLEMENTS RAMIE FIBRE CO., LTD.

Registered 24th July by Grundy, Kershaw & Co., 4, New-court, Lincoln's-inn, W.C., with a capital of £50,000, in 48,250 £1 shares, and 35,000 shares of 1s each. Objects: To adopt and carry into effect two agreements, the first expressed to be made between J. M. Macdonald and H. H. Boyle of the first part, and this company of the other part; the second made between the Boyle Fibre Syndicate (European Patents), Ltd., of the first part, and J. M. Macdonald of the second part; to acquire the Macdonald-Boyle invention for the treatment of ramie or rhea fibre for the Straits Settlements and elsewhere: to carry on business as ramie planters and dealers in and planters and manufacturers of all the kinds of vegetable products; as merchants, importers, exporters, shipowners, forwarding agents, under-writers, &c The signatories are:—

| | Shares. |
|---|---|
| B. J. Broadbent, 34, Royal Exchange Manchester .. .. .. | 1 |
| F. C. H. Bowman, Knutsford, Cheshire.. | 1 |
| J. Wade, Alma-terrace, Manchester .. | 1 |
| J. MacCallum, 11, Mosley-street, Manchester .. .. .. | 1 |
| T G. Scarborough, J.P., Halifax .. | 1 |
| W. S. Rostron, Lyndhurst, Whitefield .. | 1 |
| J. S. Pixton, 12, Half Moon-street, Manchester .. .. .. | 1 |

The first directors—of whom there shall be not less than three nor more than ten—are to be elected by the signatories. Qualifications, 500 shares. Remuneration, to be fixed by the compuny.—*Financial Times.*

## VARIOUS PLANTING NOTES.

Rhea Fibre.—From our leading English contemporary we also give an extract dealing with the rhea fibre industry in India. The cultivation of rhea is, we believe, being tried certain in estates in Ceylon, and we should like very much to hear the result so far.

Coffee in Coorg.—From the official forecast of the coffee crop in Coorg for 1896-97 we learn that an indifferent crop estimated at $2\frac{1}{2}$ cwts. an acre on European plantation is anticipated. A yield of 1 cwt. an acre is estimated for Native gardens. The total estimated crop is given as $4,211\frac{1}{2}$ tons. The estimated average yield per acre of ordinarily well cultivated coffee in full bearing for 1896-97 was 3 cwt. Taking the average or rupee crop at 3,569 tons per annum, the forecast of 4,211 tons for the coming season represents a 19 annas crop, the anna equivalent being $\frac{4211}{19}$, or nearly 222 tons.

Wild Tea Seed.—The *Indian Agriculturist* of Aug. 1st says:—Those who have made forward sales of tea seed, for the next two or three years, have reason to congratulate themselves on their foresight. We learn from an authentic source that wild tea, of which the best variety covers considerable tracts in the Lushai and Chin Hills, is likely to come into the market. Our erstwhile unruly neighbours are now convinced of the futility of further resistance, and doubtless will turn their attention to the collection of this valuable forest product. In fact, a commencement was made last year, but the gathering was begun too early—in September—when the nuts had not matured. These wild tea tracts need conserving, as in some instances the men who brought in the seed admitted that they had felled the tree to obtain it. Indigenous tea in Cachar very rarely seeds after being cut down to a height from the ground which allows of the leaf being plucked. What our planters call Munnipoori indigenous seed is in reality a hybrid, and yields prolifically when planted out and kept at the desired height, like the rest of the mixed plants raised on the older gardens. No doubt, the seed from this hybrid is of superior class; but still it is not so prolific in leaf as the pure indigenous variety. We know that large tracts of wild tea exist in the Hukong Valley and the Naga Hills, subject to and north of Munnipoor, so that it is not mere speculation to surmise that the mountain ranges in the valleys of the Chindwin, Maghung, and basin of the Irrawaddy may prove equally rich in this respect. The country is quiet enough now, and neither Singphoos nor Khamptis object to the European traveller, though cherishing a mortal dislike of the Marwaree.

## SOIL INOCULATION.

For very many years past medical men have practised "inoculation" against some of the ills of the flesh, but inoculation of the soil for the purpose of affording to plant life its food in a suitable form is a comparatively new idea. Agriculturists are now to have an innings, and the question is one in which, no doubt, planters and agriculturists generally will feel keen interest. Equally should it prove interesting to that useful body of men the manufacturers of manures, who may very possibly have to vary their labours of steaming and crushing bones, milling poonacs, converting fish into guano and grinding phosphates, by turning their attention to the supplying of pure cultivations of different forms of bacteria! How soon may it not be before a planter in ordering his annual requirements of, say, bones and poonac will add a request for so many bottles of a suitable culture of bacteria? *Planting Opinion* has been touching the fringe of the matter in the correspondence that has appeared in its pages about the cultivation of coffee without manure, in connection with the shade-tree *Erythrian lithosperma;* and enquiry has thereby been aroused into the question of the fertilising qualities of the loppings of the leguminous tree, and of leguminous crops. It is now well known that plant-life, with the exception of the legumes, does not avail of the free nitrogen of the air; and that the legumes can only do so by means of the bacteria in the nodules of their roots. Nitrogen is not assimilable in its free form, but the bacteria in some unknown way convert it into nitrates, in which state it can be taken up by the plant. It is suggestive that, as we understand in the case, in soils that are rich in nitrates the nodules do not appear on the roots to anything like the extent they do when the soil is poor. Of course to the coffee-planter the particular benefit of leguminous shade-trees is that the loppings return to the soil more plant-food than they have taken out of it for in their composition are nitrates that they have obtained from the nitrogen of the air that is in the soil, through the agency of these wonderful bacteria.

Now if coffee trees were legumes it would be easy to stimulate and promote their growth in soils poor in nitrates, for we read in the August number of the *Contemporary Review* in a most interesting article by Mr. C. M. Aikman entitled "Nitragin," that pure cultures of the nitrogen fixing bacteria have been prepared, by the usual bacteriological methods, suitable for the commoner leguminous crops grown, which are preserved in glass bottles containing *agargelatine*; but—and this is a point of significance to the Indian agriculturist—"they have to be kept from the influence of light, and *care must be taken not to expose them to a temperature above 98° Fahrenheit.*" There are two ways of affecting inoculation of the soil, either by putting the seed in a watery solution of the preparation, drying and then sowing, or by wetting fine earth or sand with the solution and spreading it over the field, afterwards working it into the soil to a depth of about 3 inches. The expense of this latter method is said to be the modest sum of five shillings per acre. But coffee is not of the leguminous order, and how then, it may be asked, is the planter to be benefited. Mr. Aikman tells us on the authority of M. Pasteur that soils teem with bacteria which may be present to the number of 1,260 millions in an ounce of earth, and that these convert the complex forms of food material in the soil into simpler ones easily assimilable by plants; thus there are bacteria that turn the nitrogen that is in the soil in the form of ammonia into nitrates. Given a soil rich in its natural state, or enriched by the addition of fertilisers, with food materials which are not assimilable by plants owing to the absence of bacteria that may be necessary to effect the conversion of such materials into proper nutrients, it will at once be seen how valuable would be the inoculation of the soil with the desired bacteria of the right type. May it not be the case that enormous quantities of manures are annually wasted owing to the soils to which they have been applied having in some way or another lost their supply of certain forms of micro-organic life?

The following passage from Mr. Aikman's article will be appreciated by those who have watched the discussion about the nodules of leguminous plants:—"The details of the process of nitrogen-fixation, as it is called, are not as yet known with any accuracy. That the organisms found in these nodules invade the roots from the soil and thus give rise to the formation of the nodules seems to be clearly proved. There they multiply with great rapidity and stimulate the growth of the plant cell. Living at first at the expense of the plant, as parasites, they gradually become passive, and the cells then become filled with bacterioids or bacterium-like bodies. It is when this period is reached that the plant absorbs the contents of the nodules, and leaves the cells, out of which they are formed in a limp condition. It seems doubtful whether there are several kinds of fixing bacteria, or whether the organism becomes so altered in its growth with the plant that it is not suited for promoting the growth of other leguminous plants. Whatever the explanation may be, it has been found that the organisms suitable for effecting the fixation of nitrogen for certain plants are not able to act in the same capacity for other plants." In addition to the prmiary object of the Pasteur Institute in India,—the treatment of rabies by inoculation, the programme of the Committee includes the treatment of cholera, diphtheria, anthrax, etc., and the promotion of independent bacteriological research. In connection with the health of the immigrant army of about half a lakh of coolies annually into Assam, the Indian Tea Association has not been slow to recognise the importance of the Institute, the usefulness of which will be limited only by the funds at its disposal; and the time may not be far off when the planters of Southern India through their U. P. A., may see the desirability of supporting it with the view of investigation being made into the bacteriology of their soils. —*M. Mail,* Aug. 29.

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## BANANAS, THE FRUIT OF PARADISE.

[BY "EL PERITARA," IN POPULAR SCIENCE.]

Bananas were little known in northern lands two decades ago. There are even now many small towns in the United States and Canada in which only a few bunches will supply the demand for a month. There has been, nevertheless, a great growth in the habit of eating this fruit. It has been truly said that the banana has made over the appetite of races who a few years ago had never tasted it, a conquest quite as remarkable and far more rapid than that formerly made by the potato.

"Why not!" exclaimed the jolly Vallejo, when I read this to him: "That is as it should be. Surely the *guieno* is the best gift to Nature to man, for does it not promote leisurely meditation and peace? Don't my people plant a few *varas* with the *matas* of the bananas, and so escape the curse which befel mankind because of Adam's transgressions?"

"So it is. Your people *are* lazy!" the governor retorted. "So I cannot mend the roads you complain about. Your people will not work, for they have only to plant a little today, and then for years pluck and eat. If they were hungry, perhaps they might work a little."

"They have the contented mind with the continual feast," said the consul.

"It is right," replied Vallejo, laughingly, "for was it not with the banana that the evil one tempted our mother Eve? The sly rascal knew that the ease with which she could make it ready for the eating would tempt a housewife when nothing else could. Wasn't Adam led to his downfall, to the lasting regret of all who hate work, not by the blandishments of Eve—for she was already his spouse—but by the tempting appearance, by the charming fragrance, and the bewitching flavour of this fruit?"

"That the banana was the true tree of knowledge is shown by its name," the consul remarked gravely. "*Musa sapientum* can surely mean nothing else than the 'fruit of wisdom.' And that it was the tree of paradise is further proven by the name which men of science have given it; *Musa paradisaica* can mean nothing else. Less evidence than this has served well enough to burn many a heretic at the stake in the good olden times."

"If such doubters do exist," he continued, "they may satisfy themselves as to the truth by simply cutting across a ripe banana and finding in it the sign of the cross. I doubt if better evidence was ever shown to prove that it is in very truth the forbidden fruit of the tree of knowledge which has been called the 'apple of Eden.'"

In the homes of dwellers in tropical America and other tropical countries always hang bunches of bananas, some of them ripe and sweet, more of them so green as to be fit only for boiling or for baking, in which state they are to these folk what potatoes are to inhabitants of northern lands, as they may well be, indeed, for the chemical make-up of one is very like that of the other, being:

| | Bananas. | Potatoes. |
|---|---|---|
| Water .. .. .. | 75.71 | 75.77 |
| Carbonaceous or flesh-making material .. .. .. | 20.13 | 20.70 |
| Albuminoids or fat-making matter .. .. .. | 1.71 | 1.79 |
| Woody fibre .. .. .. | 1.74 | .75 |
| Ash .. .. .. | .71 | .97 |

For uncounted centuries bananas have been the chief food for millions of people, as they are this day of multitudes of dwellers in India, in Asia and in Africa, in tropical isles and in the three Americas. And everything eats the banana—chickens, cows and pigs, cats, dogs and cattle, mules, horses and babies, all kinds of live stock; in short, the very birds, and beasts of the forest and the fishes in the streams, all eat the banna when they can get it. And it is good for them that this is so, for it is an exceedingly healthful food, which prevents constipation and resultant evils.

*Platinos*, which English folk misname plantains, are a kind of bananas for cooking. Most platinos are firm of flesh, thick of body, and not good to eat raw. Some of these varieties are big, yellow fellows, as thick as one's wrist and nearly as long as a man's forearm. Others are short and thick as to body and thin as to skin. When fried these taste like fried green apples; when stewed with a dash of lemon or of limejuice, their flavor is like that of stewed peaches; when roasted they are tender, juicy, slightly tart, yet sweet enough they are when baked in an oven with a dressing of butter. All these are yellow or red.

Soups, porridge and puddings, bread, cakes or biscuit may all be made of banana flour, which is said to be so easily digested that it may be safely fed to babes and invalids. Pies have been made of platinos with a slice of lemon, of lime or of pineapple, to give more tartness than the banana possesses. A syrup equal to that of the maple of the North is made of bananas, and the fruit stewed in syrup of the sugarcane makes a conserve found on many a table in the tropics. That variety commonly seen in the North is often stewed and stirred until it becomes like a thin apple sauce. Taken before dinner it dulls the keen edge of that unscrupulous appetite which comes of a day of canoeing, or of tramping through cool and pleasant forests that romancists have deceived us into believing are tangled, steaming jungles.

Those who best know the different members of the Musa family will have no difficulty in remembering several other uses to which they are put. The tender, unopened leaves make a soft, bland dressing for blisters of scalds or of burns, and the old leaves make fair thatching for temporary roofs. The dried leaves, torn into shreds, are used as a packing for merchandise, and the ashes of leaf and stock are used as soap for washing clothes and in many of the processes of dyeing.

The leaves of the "wax banana" are coated underneath by a white powder, which is a wax that has long been a valued commodity.

Banana leaves serve a few other useful purposes, for of them are made tough paper, from the thickness of thinnest tissue to thickest cardboard; clothing, hats and brushes, mats and hammocks. Millions of pounds of banana fibre, misnamed Manila "hemp," are each year brought to the United States or taken to Europe and spun into cordage from the fineness of silk up to the size of the twine with which myriads of farmers in the States bound millions of sheaves last harvest, to the bigness of mammoth cables; and many a dainty handkerchief and bit of fine lace has been woven from the fibre of banana leaves by the deft fingers of the women of South America and the far East.

## THE INDIARUBBER INDUSTRY.

The United States Consul at Barmen, in a recent report to his Government, says that the world's consumption of india-rubber has been growing so enormously during the past few years, that the time does not seem to be far distant when the demand will greatly exceed the supply. Already the difficulty of getting a sufficient quantity of rubber to meet the current needs, has led consumers to fear that there will be an early famine. One of the chief causes of this heavy increase in consumption is of course the employment of the material in the bicycle trade, and long before the limit has been reached in this direction, another field is being opened up in the use of pneumatic tyres upon vehicles of all descriptions. The United States is one of the largest consumers of india-rubber at the present time, but that country is followed pretty closely by Great Britain. The other markets follow a long way behind, but the quantity imported by France and Germany is a no mean proportion of the trade done in this material. It is certain that the threatened famine in india-rubber—or, more properly speaking, caoutchouc—would not be so imminent as it is, if the owners of the plantations in West Africa and elsewhere had been a little less reckless in their methods of tapping the trees. In order to more easily get at the milky juice, it has long been the custom in West Africa, and in some of the South American States, to cut down the trees bodily, so that the collectors secured only one lot of the caoutchouc from each tree instead of a large number of periodical yields. The prevalent idea that this policy was justified by the almost unlimited range of forests producing caoutchouc, was very soon found to be groundless, and stringent regulations have been made to prevent the cutting down of the trees in many countries, and owners are going to a great deal of expense by laying out new plantations, which must take several years to come to maturity. In the meantime efforts are being made to compensate for these limited supplies by producing artificial india-rubber, and several new processes have lately been brought out in France and Germany, though without as yet producing india-rubber of a suitable quality upon a commercial scale. The most obvious way of meeting the demand for this material is to give more attention to some of the other rubber-producing trees that are to

be found in considerable quantities in South America and elsewhere. At the present time French capitalists are trying to make profit out of the scarcity of india-rubber by utilising the balata, which, for many years, has been employed upon a small scale for a variety of purposes. There at least two descriptions of balata, one white and one red, the latter being known as the "bullet-tree." The species being exploited in French Guiana is the *Mimussops balata*, a magnificent tree which is peculiar to all the Guianas. It attains a height of from 90 to 100 feet. The wood is very much sought after the cabinet making, on account of its beautiful colour, while it has also the property of resisting the depreciation of insects. These merits are almost fatal to the existence of the tree as a rubber producer, and in some of the South American States, forests are being cut down without any regard to the profit that can be secured by tapping them in an intelligent manner. In Venezuela the tree is also to be found in great abundance, and it grows very freely in the mountainous districts of the northern states of South America. In British Guiana immense forests are found in the low-lying districts of swampy Canje. In a report on the balatas, published recently by M. Hayes, a colonising agent, it was said that there was a sufficient expanse of forest in the Guians to allow of the exploitation of rubber being carried on for centuries. It was however, necessary that something should be done to prevent the wholesale destruction of the *Mimusops balata*, which would very soon disappear, if alloweed to be cut down indiscriminately for its wood, and one of the richest and most prolific resources of South America would thus be destroyed. In fact, both in Venezuela and the Dutch Guiana the trees are cut down with a view to collecting as much of the juice as possible, and in French Guiana the same process was for a long time employed. When the trees are thus felled, circular cuts are made every 12 inches, and receptacles are placed underneath to catch the juice. The bark is also removed from the tree and juice extracted from it by presses. In British Guiana it is only permissible to tap the trees without felling them, and a similar restriction is now imposed in the neighbouring French colony. The English method of collecting the rubber is to make horizontal incisions halfway round the tree, and connect them with a vertical channel to allow of the fluid flowing down into the receptacle, but a better method is said to consist in cutting out rectangular pieces of bark from which the juice is exracted by presses. Alternate rectangles must, of course, be left on the trunk, and these can be removed at the next tapping, when the exposed parts of the tree are sufficiently healed. To secure perfect vitality in the tree, it is preferable to tap it only over a third of its circumference every five years. If properly carried out, the collection of balata rubber is a very profitable industry. One traveller in French Guiana, who was accompanied by three men, collected 666 litres of juice in 119 days, which produced, on coagulation, 720 lb. of rubber. It is estimated that a single balata will supply 2 lb. of rubber every year without suffering to any appreciable extent from the tapping. The system usually employed for securing coagulation is to pour the liquid into large shallow pans, about 4 inches deep. A hard crust very soon forms at the surface, and this is removed to allow of another crust forming, and so on until the whole of the juice is solidified. The crusts are then hung on lines to dry. The balata rubber, though perhaps slightly inferior to caoutchouc for certain purposes, and notably as an insulating medium, is yet specially adapted for a great many uses, such as machinery, belting, mackintoshes, surgical appliances, &c., but its merits are so far recognised that a considerable trade has grown up during the past two or three years in the Guianas. While the exports of balata rubber from British Guiana in 1881 were only 41,000 lb., they were no less than 363,480 lb. in 1889, and though the total fell to 237,450 lb. in 1892-93, the value has been rapidly increasing. In Dutch Guiana the industry has not been carried on in such a systematic manner, nevertheless two American companies are exploiting the balata on a large scale, and are sending the product to the United States. That the industry can be made a very profitable one may be seen in the price paid for the rubber, which varies in Paris from three to eight francs per kilogramme (kilogramme—2·204 lbs. avoirdupois), according to quality. It is evident that, while industrial enterprise, says Consul Merritt, is lying under a cloud in South America, it may be to the interest of capitalists to turn these balata resources to account. In this connection, a few notes are added to show the condition of German rubber companies. The new buildings of the German Rubber and Guttapercha Goods Company (formerly Volpi and Schluter) at Berlin, erected during the latter part of 1894, are now occupied. The dividend for 1894 was 4 per cent. The products are mainly supplies for railroads, and the capital is 1,400,000 marks (£70,000). At the general meeting of the Mannheim Rubber, Guttapercha, and Asbestos Factory, it was resolved to pay at once a dividend of 8 per cent. The dividend declared on the business for 1894 of the United Berlin Frankfort Rubber Goods Factory was 8 per cent., and the same for 1895. An exceptionally good showing is made by the Hanover Rubber Comb Company—a joint stock company. Their profits for 1894, after ample provision had been made for the usual reserves, permitted a dividend of 21 per cent. to be declared. The dividend for the preceeding year amounted to 17 per cent. —*Journal of the Society of Arts*, Aug. 14.

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## THE FUTURE OF COFFEE PLANTING: LADY-BIRD BEETLES FOR COFFEE-BUG, &c.

Among the editorials in the latest file of a London leading financial paper—the *Financial Times* of August 13th—is one on "The Brazilian Outlook," giving an account of the failure of a well-known and old established Rio firm with liabilities of over £600,000! And although our contemporary does not take a gloomy view of the future, it admits that "a mild commercial crisis" is not unlikely, and we know what a disturbing influence that must have on a great planting industry, and especially on the development and extension of planting—on which the continued prosperity of the Brazilian coffee enterprise so greatly depends. Here then we have a new and strong argument for faith in the future of "coffee" as a product not likely to be over-supplied from any quarter for a long period to come. We have already given our reasons for this faith in respect of the Eastern hemisphere, and if any check should be placed on the Brazil enterprise, the encouragement to try our old staple freely not only in Africa and Java, but in the Straits and once again in Ceylon would be very great indeed. We had the other day an interview at Cambridge with Professor Marshall Ward—now permanently attached to the Scientific Staff of the Cambridge University after some eight years' work in connection with Cooper's Hill College. It will be remembered that Professor Ward (who is still in the prime of life) won his spurs as a scientist, by his careful observations and able working out of the Life History of *Hemileia Vastatrix*, the fungus which practically destroyed the Coffee Industry in Ceylon. Professor Ward, who recalls with pleasure his stay in our midst and the many valued friends he made among the planters, was much interested in hearing of the marvellous development of our tea planting, and still more at its so entirely superseding coffee in all the Kandy and higher districts. Like every one else who recalls the old conditions, he deprecates the universal and continuous planting of "tea." "Why can't you have it broken up?" "Why, entirely abandon coffee?"—were some very natural questions; but

the fact that the tea plant was more healthy and profit-yielding, while coffee continued to shew the disease and to be very uncertain in profits or to yield none at all, were sufficient answers. Moreover, Mr. Ward was reassured by learning how very hardy the tea plant with its deep roots into the subsoil proves with us in Ceylon and its special suitableness for our leaf-growing climate; while, so far at any rate, no dark cloud appears on our horizon. Nevertheless, no one with the welfare of tea and of the colony at heart can do otherwise than desire, with Professor Marshall Ward, to see our tea plantations or districts "broken up," that is to have something else besides a continuous expanse of the one product. We have, of course, in the high districts far more of tree belts, boundaries and groves than in the coffee days; but Mr. Ward would evidently like to see every tea estate, if possible, marked off from its neighbourhood by goodly belts or groves of fuel or timber trees—or why not, in some cases, by fields of India-rubber yielding trees or vines? This is a subject on which we have to write separately very soon; for there can be no doubt that there is a great future before "rubber"—indeed the demand for cycles alone is increasing every day and the price of the raw product is rising. Ceylon tea planters should take the hint betimes as far as possible.

But none the less may we commend the bold and enterprising few who have been of late replanting coffee in some parts of Ceylon, and we would ask if more cannot be done in this direction? In Uva, we know, planters are not so much afraid of the fungus, as of the coccus, bug-insect; and in this connection we have to introduce to special notice, a letter from Mr. E. E. Green which—to our great regret—has been delayed nearly three months in delivery, through an oversight at one of our old addresses. The letter is as follows:—

Bearsted, Maidstone, Kent, 17 May—96.

Dear Mr. Ferguson,—On back you will find extracts from letter from Mr. Kœbele—*re* the importation of Lady-bird beetles from Honolulu.

He seems to think we should get them direct from Australia. But here again is the difficulty that—unless very great care is exercised—the parasites of the beetles may be introduced as well; which would completely nullify the utility of the undertaking. It would require an experienced man to collect the beetles and keep them under observation for some time before liberating them. From the tenor of his letters I gather that Mr. Kœbele himself might be willing to undertake this work—for a consideration.—Yours very truly,

E. Ernest Green.

(Copy of letter from Mr. Albert Kœbele to Mr. E. E. G.)

Honolulu, 21st April,—'96.—It will be useless to attempt sending living specimens of Coccinellidæ (Lady-bird beetles) to Ceylon from here. Of the many sent from here to California, none arrived safe. Why not get them at their home in Australia? Later I may be able to do the work for the Ceylon planters. Surely it would not cost them much if all help together. And I could guarantee that the work would be properly and successfully carried out without any mistake. All things look well here: the coffee trees are now practically clean.

The fact that the lady-beetles have cleared the coffee trees in Honolulu of bug, is a great encouragement to planters in Ceylon and India and the Straits to take steps to introduce them into their plantations; but how is this to be done? We fully agree with Mr. Green that the wise plan would be to employ Mr. Kœble himself to do the work—as indeed he offers. On the other hand, there are so few proprietors now with any appreciable area under coffee in Ceylon, that the needful contribution might come rather heavy on their acreage in comparison with the prospective return. Why not, therefore, ask coffee estate proprietors in Coorg, the Straits and even Java to join in the mission? Mr. Kœble, on his way up from Queensland, could deliver a portion of his consignment at Batavia (or wherever fixed) and to an agent for the Straits at Singapore or Penang, before coming on to Colombo. Who will move, among the Uva planters interested, to make the necessary inquiry—or perhaps the first (or a simultaneous) move would be for Mr. Green to get an estimate of cost from Mr. Kœble—his own salary or allowance, travelling expenses and contingences, and then to invite contributions from all coffee proprietors or intending planters in the countries or districts named. Mr. Kœble's mission might, possibly, mark a new era in the history of coffee in Ceylon—marvellously chequered and romantic—full of ups and downs—as that history has been in the past.

J. F.

## FARMING IN SOUTH AFRICA.*

Professor Wallace has done something to be proud of in this work. After his annual course of lectures at Edinburgh closed in March, 1895, he, at the invitation of the Government of Cape Colony, started on a four months' tour in South Africa for the purpose of investigating its agricultural condition and resources. Every facility was granted him for carrying this out effectually. The literature of the subject was placed at his disposal, introductions to the leading farmers were given him, through the fruit and wine growing districts of the west he was accompanied by a horticultural expert, as companion in the stock-rearing districts he had Dr. Hutcheon, the well-known colonial veterinary surgeon; and even nature favoured him, for he tells us that although the nights were chilly his journeys were performed in bright clear winter days. The chief danger—and we confess that it made us eye the book askance for many days as it lay on the table—was that he would compile one of these huge mountains of dry fact and arid disquisition which the agricultural mind so often builds up. But, luckily for the reader, Professor Wallace preferred to write a book. He has many sympathies outside of tillage, and he gives one the impression of an intelligent open-minded explorer keenly intent on farming, yet with an eye that seldom misses anything of human interest. The volume has also the advantage of being in the best sense of the word illustrated. For instance, you may follow the author's account of the route on an excellent series of maps produced by Mr. Bartholomew, and one is helped to realize the descriptions by excellent photographs of scenes and homesteads, of carts and markets and rivers, of all that composes African rural life. The plan, after a number of preliminary chapters devoted to the physical features and geology of the district, is to deal with the various branches of farming in succession. One of the most interesting of these is the chapter on viticulture. The Huguenots, who arrived in 1688, brought with them vine-sticks from the South of France, where the heavier classes of wine are made, and the colony soon obtained a reputation for its sweet wines—sweet Constantia, for instance, was at one time a favourite

* "Farming Industries of Cape Colony." By Robert Wallace, F.L.S., &c. (London: P. S. King and Son.)

delicacy of the London season. Only recently have light wines been produced from grapes imported out of Northern France. A great deal of harm was done to the industry by the fate of the wine consigned for competition to the Paris Exhibition of 1889. Barron A. von Babo had been appointed "Colonial Viticulturist" in 1884. He did a considerable amount of good by insisting on cleanliness, but made the mistake of persisting in an attempt to make low percentage beverage wines of the stamp of *vin ordinaire*, and the consequence was they would not stand the equatorial heat of the voyage, but were spoiled by a secondary fermentation on the way. The discouraging effects of that blunder are still visible in the colony, though undoubtedly it has the means of retrieving its old reputation. The chief wine districts are situated in the divisions of the Cape, Stellenbosch, Paarl, Robertson, Worcestor, Oudtshoorn, and Ladismith.

Ostrich farming is a prominent South African industry, and into a score of pages the author has compressed as lucid and concise an account as we have read. But he does not recommend any one to place his chief dependence upon it. From the bi-monthly sales held in London he shows the extraordinary fluctuations in price which make ostrich keeping so much of a speculation. The results of it must always depend on the whim of fashion. The record year was 1882, when the declared value of 254,000 lb. was £1,094,000. Last year the declared value of 353,600 lb. was only £527,700. At present the tendency is for the largest and finest feathers to decline in price, while those with this, mention is made of a practice common on some farms of keeping geese for the purpose of plucking them five or six times annually—a custom repugnant to one's notions of kindness to animals.

Professor Wallace is nothing if not an authority on stock, and the practical farmer will find the chapters on sheep, cattle, and horses of the utmost value. In each case photographs of typical animals are given with the text. The two most popular breeds of European cattle are the Holstein Dutch or Friesland and the Shorthorn. A keen rivalry exists between the advocates of the two, but it simply comes to this, that the Dutch will stand hard times better, while the Shorthorn is more profitable where the soil is rich and the climate favourable. Dairying is advancing rapidly, and though, according to the last statistical returns, 1,782,464 lb. of butter was imported into the colony, Professor Wallace looks forward to the time when it will be an exporting country. South African opinion is in favour of Government offering a bounty on exportation, as was done in Victoria. We have not space in which to follow our author into his most interesting history of the various attempts made to improve the breeds of horses, or his equally thorough account of the sheep. Indeed, it has not been possible to do more than glance superficially at one or two aspects of a most complete and ever entertaining book. It promises for long enough to be the standard work on the subject.—*Pall Mall Gazette.*

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Coffee in Bengal.—It is mentioned that the efforts to introduce the cultivation of coffee into Bengal, in the Chittagong Hill Tracts and Hazaribagh, appear not to have been very successful, as from ten acres under cultivation in 1888 there are now only two.—*Madras Times*, Sept. 7.

## LONDON TEA LETTER.

(From Our Own Correspondent.)

31st July, 1896.

### LABOUR QUESTION.

Apart from the increasing momentousness of this subject, owing to the pressure for extensions everywhere, the increased requirements for fully developing the existing areas by more thorough cultivation, and finer and at the same time the closer plucking in most instances practicable, in many cases rendered a matter of life and death by over-capitalising as with new companies generally, there has recently been no lack of matter leading to its consideration. In the first place we have had the opinions expressed by Sir Charles Elliott (fresh from consultation in Calcutta) and Sir Steuart Bayley in the discussion which followed Mr. Christison's paper read before the Society of Arts on "Tea Planting in Darjeeling." Both these eminent officers have been Chief Commissioners of Assam as well as Lieutenant-Governors of Bengal. As referred to in my last, Mr. W. H. Verner dealt with the subject in an able and exhaustive address as Chairman of the Annual General Meeting of the Singlo Tea Company; and last week at the Annual Meeting of the Indian Tea Association (London), Mr. Berry White, as Chairman, and other leading members expressed their views, all agreeing that of the many important subjects under consideration "the most important was the Labour Question." The two ex-Governors were in accord as to the evils of the present system and their causes, and their descriptions were equally graphic. As pointed out by Sir Charles Elliott, the tea industry incurs an unnecessary outlay of 50 lakhs of rupees annually on the coolies imported into Assam, owing to the suicidal competition of employers in the labour market. He contrasted the colonial emigration, which was effected at a cost of 15 rupees per head compared with R150 for Assam. The difference between the actual cost of conveying the labourer from his home to Assam and the actual cost to the employer is very great, and this difference does not go to benefit the coolie but goes into the pockets of the middlemen. And as Sir Stuart Bayley puts it, "inevitably there is a fierce struggle for this margin. 'Where the carcase is there are the eagles gathered together, a whole horde of middlemen, contractors and their agents, licensed recruiters, unlicensed recruiters, gardens sirdars, and what not, all contending for the *corpus vile* which was to yield his profit, and systematic recourse to fraudulent recruiting and even kidnapping became common, sufficiently common to be felt as a discredit to the administration and one not easily to be put down." Sir Charles Elliott's words were:—"The great evil which had arisen with regard to the competition for labourers had arisen from the immense number of different persons which were competing with each other—deceiving each other, stealing each others coolies, kidnapping women and children, or enticing them by false pretences and even using force and wrongful confinement so that they constantly figure in the Police Courts." The remedy for all those evils now generally recommended and believed in is a central recruiting agency under Government control. It is believed that this will be recommended by the Commission recently appointed by the Government of India. Constituted as human nature is, we know from experience that it is impossible to get the majority to realise and act upon it, that what is for the common interest is for the individual good in the long run, and subordinate private needs to the good of the industry, or prevent one employer trying to steal a march upon his neighbour. Hence, all considered, this scheme of a common agency is the best practicable, though not without drawbacks, most of which were reviewed in a very fair and proper spirit by Mr. Verner in the address referred to. He pointed out that such an Agency might lack the energy to recruit so as to meet all the requirements of the industry, and provided it did not, how were the coolies to be fairly distributed among the applicants? All but the authorised agents found recruiting are to be prosecuted as criminals and punished accordingly

It is understood however, that garden sirdars will be permitted to recruit for the Dooars and other districts not under the Act. It is admitted that a great deal of the evil is due to the rascally sct called "Arkattis," and that they must be got rid of. But will not these Arkattis and other evil-doers endeavour to make out that they are garden sirdars? Mr. Verner did not in his last address allude to this aspect of the difficulty attending the proposed Central Agency, I suppose because the Company meeting he was presiding over was an Assam one; but on a former occasion, I think at a meeting of the Indian Tea Association, he dwelt prominently on it. It is to be presumed the garden sirdars must be under control of the Central Agency in the collection of coolies. but cannot be so in regard to their destination or distribution. With all precaution therefore the recruiting by garden sirdars, a necessity for the Dooars, may lead to misrepresentation, recrimination and serious complications. This point certainly demands careful attention.

SCIENTIFIC EXPERT.

At the Association Meeting referred to, there seems to have been some discussion as to the desi ableness or otherwise of such for tea. No doubt with the cost of pushing for new markes, it may seem beyond the power of the tea industry to pay a competent expert adequately and retain his services long enough. I am not so very sanguine of a great deal being accomplished beyond what has already been done by the so-called "rule of thumb" experiments in manufactures, because I do not believo that chemistry is calculated to do so much for tea as in many other processes of manufactures. Still it is but science should work hand in hand with practical men. and in the eourse of years—it might be very soon—be productive of great results even in manufactures. Neither might science soon do much for the case blights and pests, but it could hardly fail to do something. but I think it is in the analysis of soil' to ascertain what manure or application is required to yield or improve quality, most that is to be expected. In regard to this vital matter practical man are entirely in the dark, and experimenting is of little avail. Of course in regard to manuring *accordoring to soil* for healthy plant growth generally also, a competent agricultural chemift could not fail to to be of the greatest service. The Association engaged an expert (Mr. Bamber), but did not continue his services a sufficient time to give a chane. He was only allowed time to ascertain his position and be prepared to make a fair start He only visited two out of the many tea countries of India and never set foot in the one conspicous above others for quality. But we must admit that he perhaps did all that was possible in the time and for that he should have full credit. His report is the only standard work upon Indian tea since Colonel Money's. He gave the various opinions held or expressed by planters on different subjects, described or referred to all the bests and blights that tea is hear to; but without aiding much as to their eradication of cure, and whatever was added to our knowledge of the chemistry of tea, nothing was contributed to improvement in the practice of manufacture. Had Mr. Bamber's services been retained for a coupli of years longer, I am sure the result would have been very different. Allusion was made to some remark of Dr. Voelcker recently made before the Royal Society (?) that such a scientific enquiry should extend over a period of twenty years and that cannot be denied by anyone taking an intelligent view of the matter. But one speaker asks "how many proprietors of tea gardens could be found who were so considerato for posterity as to spend large sums of money annually from which they themselves could derive no benefit?" But with a long-lifed crop like tea especially, this is just what must be done in the interests of the present proprietors quite as much as in the interests of posterity. There is often short-sighted procedure in regard to tho management of tea property, that is quito as much against the interests of the present as futfuriy it rightly viewed. The same applies to the conquering of now markets, and the omploymont of scientific experts. The fruits of such labours should all be duly estimated, or in the absence of them discounted in regard to the present value of tea property. Of course, as in America, Germany, etc., the Government ought to stimulate tea proprietors, and contribute liberally towards the funds for continuing the services of competent scientific experts year after year in the interest of an industry that contributes so much towards the prosperity of the Empire as the tea industry does.

To those who can realise the difficultles attending the chemical investigation of tea culture and manufacture, and the nature of scientific research in connection with agricultural chemistry in this country, so far from thinking 20 years too long would fear it more likely not to prove long enough to obtain really valuable results, not to speak of exhausting the subject. We have only to think of the conflicting opinions and results of agricultural chemists in different countries to bear this out. And still we are doubtless bound to steadfastly prosecute scientific experiment and analysis. Sir John Bennet Lawes has for over 50 years been conducting scientific experiments with manures, and in agricultural chemistry generally, aided by that eminent chemist Dr. (now Sir) J. Henry Gilbert. They do not consider the subject exhausted; so far from it, Sir John Lawes, who has all these years conducted these extensive and costly experiments and maintained a fully equipped laboratory at his own expense in 1889 set apart £100,000 under the necessary trust deed in order that the experiments may be continued after his death. Such is his idea of the time necessary for such investigations, and our duty to posterity in such a cause I have for over thirty-five years had my attention directed to Sir John Lawes' experiments and recently paid a visit to Rothamsted, and had the advantages of having the experiments and laboratory shown me and much valuable information supplied by Sir Henry Gilbert. On some other occasion I may have more to say on the subject of a scientific tea expert, the Rothamsted investigations and kindred subjects. Ceylon is not only urging the employment of a scientific expert for the island, but that tea manufacture be taught systematically in their technical schools.—*Indian Planters' Gazette*, Aug. 29.

## INDIAN TEA ASSOCIATION.

Abstract of Proceedings of a Meeting of the General Committee, held on the 5th Aug. 1896.

Proceedings of a General Meeting of the Central Travancore Planters' Association, held on the 11th July, were submitted to the Meeting. In these proceedings the Committee noticed that the following Resolution had been carried unanimously:—

"That steps should be taken for commencing an agitati n for the removal of the three months' prompt for tea sold in London, and for the substitution of a one month's prompt as in the case of coffee, and that this Resolution be sent up to the United Planters' Association."

The Committee were of opinion that this was a matter which might also be taken into consideration by this Association, and it was decided to draw the attention of the London Committee to the proceedings of the Central Travancore Planters' Association in connection with it and to enquire at the same time whether any alteration in the prompt would interfere with, or be detrimental to, the smaller buyers.

The Report of the Special Committee which had been appointed to investigate the question of the handling of tea at the Tea Warehouse and Jetties, was confirmed. The Report had been divided into two portions, one of which formed the subject of a representation to the Port Commissioners, and the other was embodied in a Circular letter addressed to all members of the association on the packing of tea at gardens.

A note made by Mr. G. B. Paris now came up for consideration. Mr. Paris suggested that all shippers of tea should issue a circular to the liners authorising ship's officers to refuse all chests they are not perfectly satisfied with, the result of which would be that shippers would be in a position to enforce their claims on the steamers.

Mr. Paris having explained the full purport of such action, stated that he himself had got a guarantee from one line of steamers that all claims for damage would be paid in England without any question under this arrangement.

Mr. Paris then referred to a Circular letter which had been issued by the Committee of the Tea Traders' Association to Brokers requesting them to mark in their catalogue all slack-packed and cross-cut packages. He laid on the table Brokers' catalogues for the previous week's sale, and drew attention to the very large percentage of slack-packed packages in the sale.

Mr. Paris further produced a list of invoices each of 300 chests of tea shipped to London, showing losses in weight averaging from 1½ to 3 per cent., and also two invoices each of 300 chests of tea shipped to Manchester, one of which showed a gain of ¼ per cent. and the other a loss of ½ per cent. The Manchester shipments had been specially selected before purchase on account of their being in good strong chests and it was fair to deduce from this that with good chests, loss in weight can be reduced to a minimum.

The attention of the Committee was also called to the damage to the Indian tea industry in America and elsewhere by purchasers receiving teas in chests so markedly inferior to those of China and Ceylon. Nearly all buying instructions received from America and the Colonies now contain directions to "select only packages that will reach their destination in good condition."

Mr. Paris finally drew attention to the difference in losses in weight between Ceylon and Indian tea which was fully ¾ per cent. in favour of the former.

The Committee having thanked Mr. Paris for the valuable information given them, proceeded to discuss the question of recommending shippers to issue a Circular to the liners such as he suggested, and it was decided that a Circular should be sent to all Members of the Association in the first instance asking for their opinion on the proposal.

Letters of 12th, 19th and 26th June from the Secretary, Indian Tea Association, London with reference to the American Market Fund, which had been previously circulated, were now brought up for final consideration. The Committee noted that Mr. Blechynden arrived in London from New York on the 7th June, and that the Committee had had the advantage of conferring with him on several matters of importance, such as the work in the United States, prospects in Canada and the Southern States, the question of Green Tea and other matters, also that Mr. Blechynden was calling on the principal representatives of the tea industry; especially those who had not hitherto supported the Fund. Mr. Blechynden left again on the 27th June for New York in company with Mr. Mackenzie, the Ceylon Commissioner.

A letter was read from Mr. J. Buckingham, C.I.E. Chairman of the Assam Branch, stating that at the Annual Meeting of the Branch a contribution of R2,000 was voted to the American Market Fund. The Committee had duly acknowledged this communication, and now placed on record their obligations to the Assam Branch for this substantial addition to the fund.

A letter was also read from the Honorary Secretary, Central Travancore Planters' Association, stating that his Association having been under the impression that the campaign in America was going to be discontinued at the close of the current year, had passed the following resolution at a general meeting:—

"That this Association is fully in accord with the Indian Tea Association in its determination to carry on the campaign for pushing Indian tea in America for another year, and, moreover, considers that the work should be carried on from year to year until such time as fully one-half the consumption of America is British-grown tea."

Copy of this resolution was to be forwarded to the London Committee, and the Committee of the Central Travancore Planters' Association were to be informed that no such decision as they referred to had been arrived at.

Statement of accounts of the American Market Fund to 31st July was submitted to the Committee from which it appeared that the total amount of contribution advised to date amounted to R68,407-10-6, and that there was a balance in Bank and in cash of R21,777-2-10

Considered letter of the 27th June from Dr. Geo. Watt, Reporter on Economic Products to the Government of India asking to be furnished with any information on the subject of Let Pet Tea, which the Committee might happen to have and also enquiring as to the amount of Chindwin tea seed imported into Assam, and the quantity of Assam indigenous seed annually turned out from the seed gardens of the province. The Committee were unable to furnish any information with regard to Let Pet Tea, but they had ascertained from the Chairman of the Assam Branch that certainly under 10 per cent, and probably not more than 5 per cent of the extensions in the Assam Valley had been opened out with Chindwin seed. The information furnished by Mr. Buckingham had been passed on to Dr. Watt.

Considered letter of the 24th July from the Secretary Bengal Chamber of Commerce, replying to the Committee's letter asking for the opinion of the Committee of the Chamber, on a proposal to ask the Government of India to levy small export tax upon tea as is done in Ceylon, the proceeds to be disbursed in connection with the exploitation of the American and other markets. The Committee of the Chamber in this letter pointed out that there would be very great difficulty in the way of any such impost being levied in India, as all the various Governments would have to be consulted and various contingencies might be raised. The Committee of the Chamber deprecated the idea and considered that whatever had to be done in the direction of opening new markets for tea should be done voluntarily.

After consideration of this letter, the Committee were of opinion that it was not worth while pursuing the matter further in face of the difficulties in the way of carrying out the proposals.

Considered memorandum of the 25th July from Chairman with reference to the establishment of a Pasteur Institute for India and asking for the opinion of the General Committee as to the most suitable site.

The Chairman having explained that the present intention of Government was to place the Institute in Kasauli in the Simla Hills, but that both Professor Haffkine and Dr. Ranking were now in favour of its being located somewhere in Bengal, the following minute was recorded unanimously, and ordered to be sent to Professor Haffkine, who was leaving for Simla that evening:—"This Committee having considered the question of the locality to be selected for the head-quarters of the Pasteur Institute for India, and having in mind the requirements of the large labour force estimated at 50,000 annually proceeding to Assam, as well as the increasing demands of the Dooars and Darjeeling districts, are of opinion that such head-quarters should be located in Bengal, viz., as near as possible to the possibly greatest demand which may arise for assistance from the Institute."

Consideration of a memorandum prepared by the Secretary, Bengal Chamber of Commerce, with reference to the proposal recently made in the House of Commons, for the abolition of the duty on British grown tea was ordered to stand over until the next meeting.—*Indian Planters' Gazette*, Aug. 22.

## TEA SHOOKS.

We have been favoured with an inspection of tea shooks imported from Austria for the local market by Mr. G. A. Marinitsch. The shooks are of white pine free from knots so that there should be little liability to split. There is also an entire absence of resin or of odour likely to taint tea. The shooks are dovetailed and when put together should make a very serviceable chest, which in point of lightness and cost should compare favourably with chests at present offered for sale on the local market.

## THE CEYLON PROVINCIAL ESTATES COMPANY, LIMITED.

GENERAL MEETING.

The first ordinary general meeting of the shareholders of the Ceylon Provincial Estates Company, Limited, was held on the 7th Sept. at the office of the Agents and Secretaries, Messrs. Geo. Steuart & Co. Mr. F. L. Clements presided and present were Hon. W. W. Mitchell, C.M.G., and Messrs. T. S. Grigson, J. Paterson, E. John, F. J. de Saram and A. Murray; also Mr. T. S. Grigson represented Mr. E. S. Grigson, Mrs. A. K. Wise, Mr. J. M. Smith, Mrs. Esther Crabbe, and Mr. J. L. Gordon; Mr. C. Gordon was represented by Mr. J. Paterson, Mr. John Anderson and Mr. A. W. S. Sackville by Mr. F. L. Clements, and Mr. H. D. Deane by Mr. F. J. de Saram.

Mr. CLEMENTS, in moving the adoption of the report, made a few preliminary remarks on the satisfactory working of the Company during the seven months ended 31st July last, up to which date their total earnings were R42,919·77 of which R32,487·53 remained for disposal after paying for expenses which were extraordinary. The profits represented an earning of 8 per cent on the seven months or 14 per cent per annum, which was very satisfactory. The crop for the year was estimated at 323,000 lb. of tea of which they had gathered 217,000 lb. up to the end of August last, leaving nearly one-third of the estimate to be yet realized. The average cost of tea per lb. was 29 cents and the sales averaged 50 cents Out of the profits Directors recommended the payment of an *ad interim* dividend of 4 per cent which absorbed R21,120, and R1,000 to the Directors as remuneration, carrying forward R10,367·53.

Mr. E JOHN seconded the motion, and the report was adopted.

It was unanimously agreed to pay the interim dividend of 4 per cent. after which Mr. F. J. DE SARAM proposed, and Mr. E. JOHN seconded, that R1,000 be paid to the Directors as remuneration for services rendered.

On the motion of Hon. W. W. MITCHELL, C.M.G., seconded by Mr. E. JOHN, the Directors were re-elected.

This was all the business.

The following is the

Report of the Directors for presentation to the first ordinary general meeting of the Shareholders to be held on Saturday, 5th September, 1896, at noon.

Directors:—E. S. Grigson, Esq., F. L. Clements, Esq., John Paterson, Esq.

The Directors have the pleasure to submit their report, together with a statement of accounts to 31st July, 1896.

The property of the Company consists of the Glassaugh estate in Dimbula and the Brownlow estate in Maskeliya. The former was purchased for £18,000, of which £12,000 was paid in cash and £6,000 was left on Mortgage; and the latter property was bought for £20,500, of which £10,500 was to be paid in cash and the equivalent of £10,000 in shares of the Company—the actual sum paid in cash was £8,500 an existent mortgage for £2,000 not having been paid off, and the Directors are now in correspondence with the mortgagees with a view to keeping it on for a time.

The Acreages of the Estates now stand as follows:—

| | Glassaugh. acres. | | Brownlow. acres. | | Total acres. |
|---|---|---|---|---|---|
| Tea in bearing .. | 270 | .. | 400 | .. | 670 |
| ,, not ,, .. | 24 | .. | | .. | 24 |
| ,, planted this year | 13 | .. | 50 | .. | 63 |
| Forest .. | 24 | .. | 62 | .. | 86 |
| Waste and Grass | 13 | .. | 72 | .. | 85 |
| Total.. | 344 | .. | 584 | .. | 928 |

The Company's financial year does not end until 31st December next, but to comply with the Ordinance it is necessary to hold the first general meeting within 12 months of the incorporation of the Company.

The accounts now presented show only 7 months' working of the Estates, and the Directors are pleased to be able to say that the results obtained so far come up to their expectations.

After providing for interest on the Glassaugh and Brownlow mortgages to the 31st July a sum of R5,814·56 paid the vendors of Brownlow for interest on purchase money to date of transfer, all preliminary and miscellaneous expenses incidental to the formation of the Company, and all legal expenses in connection with the transfer of the Estate, the 7 months' working shows a net gain of R32,487·53 which the Directors propose to dispose of as under:

| | |
|---|---|
| To pay an interim divided of 4 per cent | R21,120.00 |
| ,, pay the Directors' remuneration | ,, 1,000·00 |
| ,, Carry forward .. .. | ,, 10,367·53 |
| | R32,487·53 |

In accordance with the Articles of Association all the Directors retire but, being eligible, offer themselves for re-election.

By Order,

GEORGE STEUART & Co., Agents and Secretaries.

Colombo, 25th August, 1896.

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## HORNSEY TEA ESTATES COMPANY, LIMITED.

Registered, July 28, by Harwood and Stephenson, 31, Lombard-street, E.C., with a capital of £50,000 in £5 shares—4,000 cumulative six per cent preference shares and 6,000 £5 ordinary shares. Object, primarily, to adopt and carry into effect certain agreements expressed to be made by this Company with W. S. T. Saunders and Messrs. L. Reiss Brothers & Co., to acquire, by purchase or otherwise, lands, factories, buildings, &c., in Ceylon, or elsewhere, in particular the estates known as the Hornsey Estate and the Abercairney Estate, situate in the district of Dikoya, in the Island of Ceylon; to develop and turn to account the lands, buildings, and rights for the time being of the Company in such manner as they shall see fit, by clearing, draining, planting, cultivating, farming, grazing, mining, building thereon, &c.; to construct and maintain, in Ceylon or elsewhere, roads ways, rail and tram roads, telegraph lines, telephones, electric light, heat and power works, canals, reservoirs, waterworks, wells, aqueducts, water courses, furnaces, gasworks, piers, wharves, docks, quartz, saw and other mills, hydraulic works, factories, warehouses, &c.; as cultivators and dealers in tea, coffee, cardamoms, and other crops; also as miners and smelters, shipowners, merchants, exporters, and importers, carriers, agents, brokers, storekeepers, builders and contractors, company promoters, &c. The signatories are:—

| | Shares. |
|---|---|
| H. A. Hancock, 28, Mincing-lane, E.C.... .. | 1 |
| A. Zimmern, 51, Lime-street, E.C. ... ... ... | 1 |
| H. S. Hancock, 28, Mincing-lane, E.C, ... ... | 1 |
| D B. Crane, 4, Woodview-terrace Highgate, N. ... ... ... ... ... ... ... ... ... | 1 |
| A. B. Tomkins, Walmer House Surbiton ... | 1 |
| H. W. Hubbert, Lincoln House, Catford, S.E. ... ... ... ... ... .. ... ... ... .. | 1 |
| G. E. Elvish, 96, Embledon-road, Ladywell, S.E. ... ... ... .. ... ... ... ... .. ... ... | 1 |

The number of directors is to be not less than three nor more than five. The first are C. A. Reiss, H. A. Hancock, W. S. T. Saunders, and W. S. Sichel. Qualification, £300. Remuneration, 100 each per annum. Registered office: 51, Fann-street, E.C.—*Financial News*, Aug. 15.

## CEYLON TEA IN RUSSIA.

Evidence has been plentiful that the efforts made by Mr. Rogivue and his partners to introduce Ceylon teas into the empire of the White Tsar have not been without result. It is difficult to say with precision, however, the exact extent of this. The returns available through Messrs. Gow, Wilson & Stanton, admirable as these are, would not seem to afford an exact indication of the quantities of our teas that find their way into Russia. It is believed that a large proportion of the re-exports from Great Britain to Germany are destined for Russia and eventually find their way there by routes that cannot be reported upon. Anyway, the latest accounts are to the effect that Mr. Rogivue feels well satisfied with the progress achieved. It is additional evidence to that available by customs returns that the Russian tea dealers now feel coerced into keeping stocks of our teas. But we are told that their doing so arises out of no friendly feeling towards Ceylon. Indeed, it is asserted that while meeting any demand for our island production, they endeavour to weaken that demand by more than insinuating comparison disadvantageous to it between their well-beloved China teas and those of Ceylon. This need not surprise us. The same thing, we know, has been experienced in America, in which country the tea vendors have also felt themselves compelled in self-defence to be ready to supply our teas to their customers. But time has apparently broken down much of their practice of dissuading these from the purchase of Ceylons. It may well be expected that the same result will ere very long be apparent among the tea fraternity in Russia. Independently of this parallelism another is to be found between the two countries mentioned. Both are vast in extent, and the areas to be fought upon are so large as severely to tax the energies of those engaged in the struggle. But Russia is even more difficult to attack on this special ground than is America. In the United States, at all events, as in a considerable degree also throughout Canada, railway communication is widely spread. In Russia this is not the case, and it may readily be understood how exceedingly difficult it must be to foster and supply the very many distant agencies established by Mr. Rogivue's efforts. He is fighting our battle even under greater disadvantages therefore than have been experienced in America. We understand that on this ground he asks for further assistance from here. We do not pretend to say how far this should be granted; but it is easy to realise how great are the difficulties he has to surmount in a country so sparsely supplied with railway facilities as is Russia.

## NOTES FROM THE METROPOLIS.

London, Aug. 11.

The *Financial Times* on Tuesday this week had an important article on

"INDIAN TEA COMPANIES AND PROSPECTS"

—sure to attract much attention, which I send you:—

### INDIAN TEA COMPANIES' PROSPECTS.

It is not surprising to find that with the present demand for sound commercial investments, the attention paid to Indian Tea Companies' shares continues to show an increase. Even now, it may be said without hesitation that people on the look-out for an industrial lock-up, yielding what, in these days of low interest upon capital, may be described as a handsome return, might with advantage devote some attention to the attractions afforded by this market. The results certainly compare very favourably with those of other industrial investments, and as we have pointed out previously, it is possible by making a good selection to secure substantial dividends and at the same time to reduce to a minimum the amount of risk attaching necessarily commercial holdings. A purchase of Assam, Jorehaut, Chargola, or Lebong ordinary shares at present prices would show a return of fully seven per cent; Jokai, Dooars and Doom Dooma bring in six per cent. or thereabouts; while newer, and therefore more speculative, varieties offer still greater temptations in the way of interest. When in February we dealt with Indian Tea Companies' Preference shares we ventured to predict that the next few months would see a continued appreciation of prices. Although a slightly easier tendency is now apparent, our forecast has been none the less borne out—not to a sensational degree, for the very circumstances of the case render advances by leaps and bounds extremely improbable, but by steady advances that indicate healthy conditions. And the increased activity has not been confined to shares of well-known and old-established companies, but has been apparent, too, in the recent outburst of industrial promotions. During the past month or two new companies whose aggregate capitals runs well into millions have been publicly floated; and the sucess with which, as a rule, the issues have been made indicates not only that this field of enterprise is coming into favour, but that before long the market is bound to show a wider tendency, and that the greater popularity will in all probability tend to raise the level of prices all round.

The large amount of this class of share capital now quoted in the "Official List" will before long be swelled to five or six millions as a result of the recent promotions; and in addition there are unquoted securities, consisting largely of Ceylon descriptions, accounting for another couple of millions. Under these circumstances it is the more satisfactory to find that the present position of the industry is very satisfactory and that the prospects for the current year are decidedly favorable. In 1895, as we stated some time ago, the results were not quite so good as those of the previous twelve months, when the conditions were particularly good. The trend of prices was in the downward direction, and competition was much keener, but in spite of these adverse circumstances dividends were on the whole well maintained. The current year, according to present expectations, will probably witness a partial return to the prosperity of 1894. The early pickings of the new crop that are now coming to hand indicate that the season will be one for quality rather than quantity of produce. The anticipations of an excessive supply are therefore not likely to be realised, and the consequent improvement in prices should have an important effect on the net earnings of the companies. Not only is the outlook satisfactory in this direction, but other favourable influences are at work. Tea plantations, like Kaffir mines, have their labour difficulties, and if the reports that the rice and other crops in some of the most important agricultural districts of India are likely to prove very poor be correct, the tea plantations in Assam will find less difficulty in obtaining labour, and will secure it at less expense. Another reason for encouragement is supplied by the fact that the demand for Indian and Ceylon tea is constantly growing, owing largely to the comparatively low prices now ruling, and there is no sign of a reaction from the phenomenal advance of the past few years. The increase is not confined to this country, for planters are showing great enterprise in their efforts to open up fresh markets. Vigorous steps have been and are being taken to stimulate the trade with the United States, and the Ceylon traders are also devoting special attention to the cultivation of Russian custom.

Tea companies, like all other concerns, must have their critics, and, of course, like all other concerns, are not always invulnerable. The article itself, taken in large doses, is generally understood to promote dyspepsia, and the same effect seems to have been brought about in some quarters by

an examination of tho accounts of the principal producing companios for 1895. The current number of "The Investors' Review" has some very hard things to say about the group, and though some of them are perfectly reasonable, some of them appear to us to be unnecessarily despondent, if not a trifle unfair. Our contemporary suggests that the delay in the publication of Indian tea companies' reports has been caused to some extent by "preparations for 'consolidation'—a term which appears likely to bear in the future as ill a name in the tea share market as in the Kaffir circus." We have already drawn one comparison between the Indian plantations and South African mines, but the points of resemblance are surely few in number, and in the present case we fail to see the reason for the association of the two classes of enterpriso. Kaffir consolidations are "another story," but consolidations are not necessarily bad, and in many ways are productive of excellent effects. The whole question rests on the merits of individual schemes, and our contemporary, while peering into the future, when "consolidations" and their accompanying evils have done their fell work," makes no attempt to show that the various plans that have been carried through recently have, as a whole, involved unfairness to shareholders, or that they have made loopholes for plunder. Most of them indeed, have been framed on equitable lines, and have been justified by the appreciation in market values. The criticism that some of the companies show a regrettable inclination to divide their profit right up to the hilt is certainly justified in some cases; but here again there is something to be said on the other side. Many of the concerns whose financial methods aro questioned in this respect have devoted large sums from revenue to betterment purposes, and although the possession of large reserves is obviously an advantage, and the equalisation of dividends an eminently desirable policy, it cannot fairly be said that the companies have been altogether indifferent to future needs.

It has brought forth the following letter and further editorial comment:—

INDIAN TEA COMPANIES.

(To the Editor of the *Financial Times.*)

Sir,—Your carefully-written article of 10th inst. is calculated to lead many investors to pay more attention than they have hitherto done to the tea industry; and as it is difficult for anyone outside the trade to get the materials for forming a sound judgment when choosing a company in which to invest, it may be useful to your clients to have a standard, the more so as all tea plantations are not equally good or safe.

The best criterion is the average price per planted acre which a company's capital shows, taking the share at its market quotation.

Let me take as an illustration two of the concerns you name in your article, namely, the old Assam Company and the Lebong Company in Darjeeling.

The Assam Company's capital of £187,000 at £59 por share equals £555,000, less £50,000 reserve fund, equals £505,000, for its 10,100 acres of tea, that is, about £50 per acre. The Lebong Company's capital of £65,660 at £18 per share equals £118,000, less reserve £18,000 reserve fund and working capital, equals £100,000 for its 1,550 acros of tea; this is, about £65 per acre.

These two companies represent the oldest plantations in tho two districts which produce the finest tea;—their produce commands a high premium in the market, and they may, therefore, be safely taken as the standard by which other concerns should be valued.

The reason why these and several other old companies are now paying such high dividends, in spite of the comparatively low price of tea, is that in bygone years, instead of dividing all their profits, they have largely extended their plantations out of revenue, of which policy they are now reaping the benefit. This, of course, is not generally known.

An investor will naturally desire to know what is the prospect of the value of toa holding up; having, no doubt, heard the foreboding reports of over-production.

At the moment it is doubtful if the supply will equal requirements, which are constantly enlarging, as the weather in India has shortened the quantity, while giving finer quality than last season; not in all districts, but in Assam to a marked degree.

The immediate effect has been to raise the price of the best growths in Mincing-lane pence per pound, as compared with last season's value; and we find the buyers, not the producers, showing some anxiety as to the future.

It is desirable when investing in tea-planting companies to discriminate between those which have their land in the districts which have proved their ability to yield fine tea during a long period of years, and those which have not; and to examine the record of each company during the last five seasons, which have included bad as well as good harvests.

The details are now compiled and published by your weekly contemporary, the "Home and Colonial Mail."—I am, &c., A TEA BROKER.

11th Aug., 1896.

Investors who have turned their attention to the market in Indian Tea Companies' shares will find some good advice in our correspondence columns from "A Tea Broker." Our correspondent agrees with the views expressed in the article on the subject that appeared in Monday's issue, and points out the importance of intending purchasers studying the average price per planted acre shown by the capital of a company. The point is one that we have previously emphasized, but with the increasing popularity of the market, it is well worth repeating. Our statements concerning the probable course of prices for the Indian produce are confirmed, and our correspondent adds that it is doubtful if the supply will equal requirements, and that buyers are showing some anxiety as to the future. This fact can hardly fail to produce a cheerful effect on the quotations for shares, especially those of the better-known companies.

So that the basis on which Tea Companies are formed is likely to be carefully scanned in future. Still, the great difference in the real value per acre, of different properties in different, or even the same, districts, is what home investors can never judge, by mere figure comparisons.

Among new tea companies, or rather business,—is the extension of the

"BURNSIDE COMPANY'S"

purchases and capital. No doubt you have published the original prospectus: here is the supplementary one:—

BURNSIDE TEA COMPANY OF CEYLON, LIMITED.

Incorporated under the Companies Acts, 1862 to 1890.

| | |
|---|---|
| Capital, in 5.000 shares of £10 each .. | £50,000 |
| Original Issue .. .. | 20,000 |
| Balance Unissued .. .. | £30,000 |

The £15,000 shares now to be issued will make with the £20,000 original issue the present issued share capital £35,000.

The £7,500 Debentures now to be issued will make with the £7,000 Debentures original issue the amount of the Debentures issued £14,500.

The 1,500 Shares now offered for public subscription are to be payable as follows:—

£1 on Application; £3 on Allotment; and the balance when called for with an interval of not less than two months between each call.

It is not intended to call up more than £5 per share.

Tho remaining £5 per share, total £7,500, will be specifically charged to secure the Debentures of the Company, the amount of which is limited not to exceed the uncalled Capital of the Company for the time being and which will be further secured by a floating charge upon the other property of the Company.

The Debentures carry interest at 5 per cent. per annum, and are payable on 31st December, 1901.

Subscriptions for tho £7,500 Debentures are payable:—

10 per cent. on application, and the balance on allotment.

They will be issued for sums of £50 or multiples of £50 each. The Interest upon the Debenture will commence from the date of Allotment, and first payment will be due on the 1st of January, 1897.

PROSPECTUS.

Since the Burnside Tea Company of Ceylon Limited, was registered the Directors have been able to secure the firm offer of Wattagalla Estate, adjoining Heeloya, in the district of Rangalla, Ceylon, from Mr. C. Tottenham for £12,000 cash; crop and expenditure to be taken over as from 1st April last. The following particulars are taken from the Report of Mr. Joseph Fraser, dated 10th March, 1896.

WATTAGALA ESTATE.

Elevation from 2,000 to 4,000 ft. above sea level. The actual area cultivated in Tea is now 302 acres in full bearing, and 80 acres of young Tea.

There are 180 acres of abandoned Tea that may now be looked upon as valueless, though portions might be cleared up and planted with Grevillias.

There are 10 acres of young Cardamoms, but I put little value on those, as the area is too small to make it worth while cultivating. The land is, however, suitable for Tea. Portions of the 90 acres of patna and scrub are suitable for planting up with timber trees.

The yield of the upper division (203 acres) is very satisfactory, having given an average of 536 lb made tea per acre all round in 93/94, while the lower division, allowing for the 13,000 lb. made tea secured from the abandoned area during the season, gave an average of 270 lb. or an average all round of close on 450 lb. per acre. Finer plucking the past two seasons has reduced the yield to barely 400 lb.

The tea is looking in excellent condition, and is capable of giving 550 lb per acre all round, with cultivation in the shape of manure.

Though portions are rather steep for cultivation, a large area of the cultivated fields are quite suitable.

The facilities for transport are greater than I expected, as the upper fields almost touch the Nitre Cave Cart Road, and would therefore make manuring a simple matter.

Some arrangement could no doubt be come to for the use of the cart road.

There is a complete system of wire shoots to convey leaf to the Factory, and manure, if need be, to lower fields.

The Sinhalese have taken to the transport of tea chests from the Factory to the cart road at Udaspattu, so that the Tamil labour is not affected—an important matter.

The Factory and Machinery is ample and complete for present requirements, no steam power necessary, water being quite sufficient during the driest weather.

The Bungalow is in good order and the lines are sufficient and permanent, a good many being iron roofed.

The following is the acreage according to Mr. Fraser's report:—

| | | |
|---|---|---|
| 302 | acres | old tea. |
| 80 | ,, | young tea. |
| 180 | ,, | abandoned tea. |
| 10 | ,, | cardamoms. |
| 90 | ,, | patna and scrub. |
| 662 | acres | total area. |

The acquisition of this estate by the Burnside Tea Company of Ceylon, Limited, will give the Company 1,126 acres in tea, costing, exclusive of all the other lands, about £26 per acre.

To provide funds for the purchase of the estate and for its proper cultivation, it is proposed to make the above-mentioned further issue of 1,500 shares and £7,500 in Debentures.

The terms of offer of Wattagalla Estate are contained in a letter from Messrs. Lyall, Anderson & Co., to Mr. C. Tottenham, dated 31st July, and his reply, dated 2nd August, 1896.

Copies of the above-mentioned letters, the report of Mr. Fraser, of 10th March, 1896, the Memorandum and Articles of Association, and the Form of Debenture may be inspected at the office of the Company.

With this circular is enclosed the original Prospectus of the Company, the First Issue of Capital which has been fully subscribed, and Applications for Shares and for Debentures of the New Issue should be made on the accompanying relative forms and forwarded to the Bankers of the Company, together with the amount payable on application.

If no allotment is made the deposit will be returned, and where the amount of Shares, or Debentures allotted is less than the amount applied for, the surplus will be credited in reduction of the amount payable on allotment of the Shares, or of the balance of the Debentures as the case may be.

10th August, 1896.

Here is good news for Ceylon and India in regard to

CHINA TEA,

and surely also in reference to opium too—for the sooner we are done with it the better!—

NEWS FOR TEA PLANTERS AND THE ANTI-OPIUM SOCIETY.

The Anti-Opium Society has directed its efforts in recent years more particularly against the export of opium to China. It looks as if its occupation in this respect will soon be gone. Chinese native opium last year became an article of export, and Consul Gardner of Amoy, in his annual report, says he has no doubt it will ultimately replace all foreign opium. "The heavy import and transit duty on foreign opium, which is rigorously collected, and the ease with which native opium evades the natives dues, will and must render the latter far cheaper, and the Chinese growers will doubtless continue year by year, as they have done hitherto to improve the quality of the drug." The extinction of the import of opium into China, as of the export of tea from China, is in Mr. Gardner's opinion only a matter of time. J. F

## THE BIG TEA COMPANY.

A fortnight ago we announced that a big allied tea company, with a capital of £1,000,000, would shortly make its appearance, and this week the prospectus of the Amalgamated Tea Estates Company, Limited, has been published. No fewer than ten undertakings will be acquired, and these include the estates of the Land Mortgage Bank of India, an estate in Darjeeling, one in Cochin, three in Ceylon, and four in Assam. They comprise in all 43,302 acres, of which a little over 10,000 acres are under tea.

The vendors state in the prospectus that they have purchased the properties at a total price of £493,693, exclusive of certain miscellaneous assets, which will be separately realised on behalf of the Company, and they go on to declare that they will transfer the whole of the property to the Company at the actual price paid, plus 5 per cent as a commission for negotiating the purchase, which will total up to the very respectable sum of something over £24,000; but out of this they will pay all expenses incurred up to the date of the agreement for the inspection and purchasing of the estates.

We suppose that there is not much to find fault with in this way of doing things, but inasmuch as the majority of the estates which are to be included in the Amalgamated Tea Company are not known, it might have been better to have given fuller particulars as to their past doings and their present value. It is estimated, after an examination of the accounts and figures "supplied by the previous owners" (which is, perhaps, scarcely such a satisfactory state of things as might have been hoped for), that there will be yielded an annual profit from the present bearing area of the estates of £40,000, and this estimate, if realised, would, after paying the interest on the Preference shares, leave a balance

of £20,000 for division among the Ordinary shareholders.

The capital is, as we were enabled to anticipate, £1,000,000, divided into equal proportions of five per cent. Cumulative Preference shares and Ordinary shares of 10 each. At present it is only proposed to issue 40,000 Preferences and 40,000 Ordinary shares, while on the latter only £2 is to be called up. We are sorry that no more satisfactory figures could be given than those "supplied by the previous owners," since, however much it may be taken for granted that people who want to sell tea estates put the exact particulars before the purchasers, it has become a general rule to take independent valuations of concerns which are being bought at a large outlay of money.

The fact that over 10,000 acres of the 43,000 acres being acquired are already planted with tea is a good point, but it might have been better if some information had been given as to how much of the remaining 33,000 acres would be available for tea planting. It is always possible that little of it might be adapted for the purpose. The Company intends to go in for coffee, while it will also cultivate coconuts in Ceylon; but a period of nine years must elapse before the coconut trees now planted will yield a sufficient crop to earn dividends. Their ultimate cultivation is said to be profitable, and the cost of planting and maintenance is comparatively cheap.

The Directors are probably acting wisely in not calling up much of the Ordinary capital until it can be seen how much it will cost to increase the cultivated area; but, on the whole, it seems to us that it might have been advisable to start with a smaller capital or with limits to the power of calling it up without taking the opinion of the shareholders. The Directors and officials of the Company, however, are much the same as those of the Consolidated Tea and Lands Company, Limited; and while we are calling attention to one or two weak points of the prospectus, we do not wish it to be understood that we take anything but a hopeful view of the prospects of the undertaking.

There are some faults to be found with the prospectus, and lack of information is one of them; but as this prospectus has only been privately issued to the shareholders of the North and South Sylhet companies, the Land Mortgage Bank of India, and the Consolidated Tea and Lands Company, we suppose it is a matter which more directly concerns them than the rest of the public. But for an undertaking with so big a capital we cannot help pointing out that the particulars are not sufficiently ample.
—*Bullionist*, Aug. 15

## PLANTING AND PRODUCE.

Terrible Effects of Coffee Drinking.—If there should be any difficulty in finding a supply of arguments in favour of tea drinking as compared with coffee, the Paris correspondent of a daily paper supplies a few. It probably is not generally known that coffee caused the French Revolution. But French doctors have discovered—they appear to have been some time about it, by the way—that coffee caused the excitability of the generation of writers who were the precursors of the Revolution, and of advocates who accomplished it. Voltaire and Robespierre were intemperate drinkers of coffee. Michelet says that the want of coffee, consequent upon Napoleon's Continental blockade, so depressed France as to make the return of the Bourbons not only possible but welcome. There had been for some years before a coffee famine. "Those used to coffee were out of their wits with joy when they could have it cheap again." This line of argument is perhaps a little farfetched, but that is the fault of the French doctors who have made these important discoveries. Now is the time to push the sale of tea in France.

Coffee Planting in Brazil.—An official report lately issued from the Foreign Office refers to the position of Brazilian coffee and the condition under which it is grown. In his report on the trade of Bahia, covering the years 1893-95, Mr. Nicolini, the British Consul, makes some interesting remarks on the decline in the Brazilian exchange. The low rate which has prevailed for the past two or three years, he tells us, has had considerable influence in inducing capitalists to invest money in coffee plantations, the producers benefiting to the extent of about 70 per cent. on the prices in Brazilian currency realised at the recent rates of exchange, as compared with those obtained when exchange ranged from 1s 11d to 2s 3d. With regard to the causes of the decline—the latest telegraphic quotation is 9 3-16d—Mr. Nicolini says that the constant disturbances occurring in most of the Northern States, coupled with the enormous cost of the civil war which for several years raged in Rio Grand do Sul and the naval revolt at Rio de Janeiro, together with the efforts of the monarchical party towards a restoration of the Empire, have greatly tended to destroy confidence; and, notwithstanding the exceptionally enormous natural resources of the country, it is the general opinion of those most interested that for years to come exchange will fluctuate between 9d and 1s. Brazilian coffee growers, by the way, are taking measures for an active propaganda, one plan being to establish cafes and permanent exhibitions in Europe in order to demonstrate the "deliciousness" of Brazil coffee when properly supplied and prepared.

The Mysteries of the Cocoa Trade.—At Loughborough, Leicestershire, recently, Dr. Dyer, the county analyst, stated that of the twenty-seven samples of cocoa which came before him nine consisted of genuine cocoa—that was to say, of cocoa partially deprived of its fat, but containing no material addition to its bulk. The other eighteen samples all consisted of mixtures of cocoa with various proportions of sugar and starch, the starch used being generally some variety of arrowroot. In all but three cases the fact that the articles consisted of mixtures of cocoa with other ingredients was declared on labels attached to the packages or parcels in which the mixtures were supplied. In the other three cases the admixture was either not declared at all, or not declared until after the vendor had been informed of the purpose for which the sample had been purchased. Seeing that "cocoa" was the article demanded in each case, he had in his official schedule enumerated all the mixtures as "adulterated"—*i.e.*, as not of the nature, substance, and quality demanded, although, as already said, the fact of the admixture was in most cases actually declared by label, and in such cases the sale was not to be regarded as fraudulent. The prices of the various "mixtures" in the market were very variable, and, generally speaking, might be said to correspond fairly with the proportions of cocoa present, so that the purchaser could not be said to be defrauded in purse. It appeared desirable, however, that the public should know that in purchasing mixtures, or at any rate the lower class ones, they were buying chiefly sugar and starch, with only a small quantity of real cocoa. Sugar and starch were, of course, nutritious, and the mixtures were, in most cases, intrinsically worth the prices charged for them. Cocoa, however, was an article which was not used merely for actual food purposes, but also, like tea and coffee, for the sake of the stimulating properties which it possessed; and if the consumer was to get the full stimulating benefit as well as the mere feeding value, of a cup of cocoa, he must use several times as much of the cheap mixture as he would of pure cocoa, so that he does not gain in the end, but pays for sugar that he could just as well add himself, and for starch which is not more nutritious than bread These starchy mixtures of course,

produce a much thicker beverage than pure cocoa, as well as a much sweeter one, and no doubt for this reason mixtures are relished by many persons; but it appeared desirable, from a dietetic point of view, that some more precise information should be given on the labels as to the proportion of actual cocoa present than is provided by the mere statement that the cocoa is "combined with other ingredients, the purity and wholesomeness of which are guaranteed in accordance with the Act of Parliament," or similar inscriptions. The best mixtures were two samples representing a well-known make of mixed cocoa, consisting of 50 per cent of cocoa from which none of the original cocoa butter had been removed, the remainder being sugar and starch (arrowroot) in equal parts. Six more samples representing other makes contained not more than 40 per cent of cocoa partly deprived of its fat, the remaining 60 per cent being sugar and starch. One sample contained not more than 30 per cent of cocoa, and two not more than 25 per cent, while five samples contained not more than 20 per cent of cocoa or less, the remainder of the sample in every case consisting of sugar and starch in about equal proportions. With a few exceptions the cocoa present was partly deprived of its fat, though in some few cases the whole of the original cocoa-butter was present. This, however, seemed to be the exception and not the rule, although one plea put forward for the manufacturer of cocoa mixtures in preference to real cocoa was that the admixture of sugar and starch obviated the necessity of removing part of the original fat. From the foregoing remarks it would be seen that in the case of cocoa mixtures it was necessary to purchase from 2 lb. to 5 lb. of the mixture, according to quality, to obtain 1 lb. of real cocoa—a fact which should be borne in mind in comparing prices.—*H. & C. Mail*, Aug. 12.

## GRAPE CULTIVATION AT THE AGRICULTURAL SCHOOL.

We have today seen a sample of the grapes grown at the Agricultural School and can testify that they present a very promising appearance, justifying the Government in continuing the experiment which has been carried on during the past year. They have a nice flavour and in the opinion of connoiseurs are up to the average of grapes grown in Australia. The variety shown us is what is called the "Golden Chasselas" and the crop numbers about 250 bunches. Amongst the grapes grown is a black variety, but they are not quite mature. It is hoped, however, that they may be ready for plucking within a week or ten days. The experiment so far can only be characterised as successful and it has had the effect of encouraging others to enter upon viticulture. We trust the Government will see its way to continue the experiment which promises so well.

## "NITRAGIN: AN IMPORTANT ANDVANCE IN THE SCIENCE OF AGRICULTURE."

The above is the heading of a brief but important paper in the *Contemporary Review* for August, by Mr. C. M. Aikman, D.SC. It is of more practical interest to agriculturists in the mother country, and indeed is not applicable to planting in Ceylon (unless in some parts of the lowcountry?); but its perusal cannot but prove profitable:—

Among the many important results which have followed from the brilliant researches of Pasteur, not the least interesting has been the discovery of the highly beneficent *rôle* performed by micro-organic life in agriculture. We now know that in nearly every department of farming the "ubiquitous germ" plays its part; and that to the presence on his farm of different kinds of microbes the farmer is almost as much indebted as to the presence of his larger stock. The functions discharged by bacteria in the dairy are now recognised to be of the most valuable order; while in the bacteria of milk the bacteriologist is finding an ever-widening field of investigation. The various changes which that invaluable article of food undergoes are all to be traced to the action of its microbic denizens; and it is no exaggeration to say that the knowledge thus gained, during the last few years, has done much to revolutionise the dairyman's art. With the information we at present possess on this subject, there should be no difficulty in keeping milk perfectly fresh, even in the midst of summer, for any reasonable period of time. Of course this involves the expenditure of a certain amount of care, and the application of precautionary measures; but these latter are so simple in their nature that they cannot be regarded as offering any serious obstacle to their satisfactory accomplishment. The timely application of the process of *Pasteurisation** is all that is required; and we may confidently look forward to the time when, in the words of another, "the purveyor will bring his supply of milk round in bottles at any hour of the day that may be convenient, exchanging the full bottles for the empty ones, as does the vendor of beer, aërated waters, and other similar comestibles; and the housewife will keep them to use as she needs, with the certainty that when the bottles are opened the milk will be as pure and as fresh as it was when it left the cow."† We need scarcely say that such a result is calculated to increase very largely the consumption of milk by the public. It would also render its use very much safer. There can be little doubt that the well-known dangers, connected with the spread of infectious diseases, associated with the use of milk, prejudice many people against it.

But a still more striking result of the application of bacteriological science to the practice of dairying has been afforded by the recent introduction of the use of "pure cultures" of bacteria in butter-making. In this respect dairying has followed the example of brewing. Many of our readers are doubtless aware of the enormous service which the introduction of the use of pure yeast cultures has effected for this latter industry; and, while the use of pure lactic cultures in butter-making can scarcely be said to have done as much for the dairying industry as pure yeast cultures have done for brewing, yet it promises to do much to improve the manufacture of butter, and to help the dairyman to secure that uniformity of quality on which the success of his business so largely depends.

The object of this paper is to bring before the readers of this *Review* the latest application, in the domain of agriculture, of the great principle of inoculation, and which, in many respects, is of a more striking nature than anything yet accomplished by this line of research. It consists of the inoculation of the soil with pure cultures of bacteria for the purpose of promoting plant-growth. Indeed, since the introduction of the practice of artificial manuring, it seems to the present writer to be the most important advance made in the art of husbandry in recent years. The full economic value of this important innovation can only be realised by those familiar with the scientific and economic problems of agriculture; but some conception of its importance may be afforded by the statement that it offers a practical solution of the great problem of how to utilise for vegetation the boundless stores in the air of one of the most important of all plant-foods—viz., nitrogen—a problem which we may add, has long

* Pasteurisation, a process named after the distinguished French chemist, consists in the application of temperatures considerably below boiling temperature, yet sufficiently high to destroy bacterial life. Milk may be Pasteurised by heating it, for twenty minutes, to a temperature of about 150° Fahr. The flavour possessed by milk which has been boiled, so disagreeable to many people, is thus avoided by such treatment.

† Dr. Bond, in Royal Agricultural Society's Journal, June 30, 1896.

exorcised the minds of the plant physiologist and agricultural chemist.

It is only a few months ago since an announcement was made to the German Agricultural Society that certain highly interesting experiments carried out by Professor Nobbe, of Tharand, in Saxony, a well-known and distinguished authority on plant physiology, had culminated in the production, on a commercial scale, of cultures of bacteria for use in agriculture; and that arrangements had been made with one of the largest chemical manufactories in Germany—the very same, indeed, which has already undertaken to supply the medical world with the antitoxic serum for use in the treatment of diphtheritic cases—to supply these cultures to any who might disire to use them. To these cultures the title nitragin has been given; and at the present moment many experimental trials are being either arranged for, or are in process of being carried out, with a view to test its efficacy. With the object of explaining for our readers' benefit the significance of this new development in agricultural science, a short account of the experiments which have led up to it may be given.

It is now a number of years ago since Pasteur showed that the process of the decay or putrefaction of organic matter, constantly going on on the earth's surface, was due to the action of miro-organic life. Subsequent research has demonstrated that the soil of our fields is literally teeming with bacteria, which, according to some recent experiments, may be present to the extent of *forty-five millions* per gramme (the 1-28th part of an ounce) of soil; and that these bacteria are largely instrumental in conducing to the successful growth of vegetation, by preparing, in forms suitable for assimilation by the plant, the different food substances it derives from the soil. Most of these substances are required in vegetable life in a simpler form than that in which they are originally present in the soil; and it is in converting these more or less complex forms of food material into simpler ones, that the useful *rôle* of the soil-microbes consists. With regard to the nature of this minute life we have but scant knowledge; but we have lately become acquainted with some bacteria which are concerned in the preparation of that highly valuable plant food, nitrogen,* in forms suitable for assimilation by the plant. It has long been known that the plant absorbs most of its nitrogen in the form of nitric acid, or, more correctly speaking, as nitrates. It has also been long well known that nitrogen, in the form of organic compounds and ammonia, was liable, under certain conditions, to be converted into nitrates in the soil; and this knowledge was put to a practical application, in the manufacture of saltpetre, in the earlier days. In the year 1877, however, it was discovered that this process, to which the name nitrification was given, was caused by the action of micro-organic life. Since the year mentioned, further research has revealed that at least two separate forms of bacteria are implicated in this process. The result of these interesting investigations has been to show that the fertility of a soil depends, to a very large extent, on whether or not it is properly stocked with the nitrification bacteria. But a still more interesting discovery was made in the year 1886, by the late Professor Hellriegel and Dr. Wilfarth, of a class of bacteria which infest certain nodules, or fleshy excrescences, to be found on the roots of leguminous plants, and which are able to render the free nitrogen of the air available to the plant.

For many years the question,—can plants utilise the free nitrogen in the air?—was a keenly debated one. The discussion of this question dates from the beginning of the present century. Elaborate experiments by French and English chemists were supposed to have decided it a number of years ago: and it was believed, till the startling discovery already referred to was made, that plants were unable to utilise the nitrogen in the air. In justice to the distinguished experimenters* whose experiments seem in contradiction to the facts of the case as we now know them, it may be explained that their experiments were carried out under conditions which excluded the agency of bacterial life. It should also be added that the power of utilising the free nitrogen of the air only belongs to certain plants, such as clover, peas, beans, &c.—these generally grouped under the term of "leguminous crops." This interesting discovery serves to throw light on the power possessed by certain crops of resuscitating soils on which other crops had been grown, and which had thus become impoverished. Even at so remote a period as the time of the Romans this fact had been observed; and the adoption of the practice of the rotation of crops, a very old custom, may be said to be based, to a certain extent, on the recognition of the same principle. The existence of nodules on the roots of leguminous plants was a fact which had also been long known; although their true function had been for long little suspected.

The details of the process of nitrogen-fixation, as it is called, are not as yet known with any accuracy. That the organisms found in these nodules invade the roots from the soil and thus give rise to the formation of the nodules, seems to be clearly proved. There they multiply with great rapidity and stimulate the growth of the plant-cell. Living at first at the expense of the plant, as parasites, they gradually become passive and the cells then become filled with bacteroids or bacterium-like bodies. It is when this period is reached that the plant absorbs the contents of the nodules, and leaves the cells, out of which they are formed, in a limp condition. It seems doubtful whether there are several kinds of fixing bacteria, or whether the organism becomes so altered in its growth with the plant that it is not suited for promoting the growth of other leguminous plants. Whatever the explanation may be, it has been found that the organisms suitable for affecting the fixation of nitrogen for certain plants are not able to act in the same capacity for other plants.

We need not enumerate the experiments carried out to test the accuracy of the above theory. Those interested in the question we would refer to two interesting papers on the subject, in the lately issued *Journal* of the Royal Agricultural Society of England, by Dr. Miller and Dr. Voelcker. The early experiments on a practical scale were made by inoculating soils, on which leguminous crops had been found by practice not to do well, with soil from fields containing the nitrogen-fixing bacteria in large numbers. To effect this satisfactorily it was found that no less a quantity than 16 cwt. of soil had to be used per acre. This method, besides proving cumbersome, is not free from other objections, since organisms other than the nitrogen-fixing ones—organisms which may exert a distinctly unfavourable action on plant growth, as well as induce fungoid diseases of parasitic growths—may be present in the soil thus applied. Professor Nobbe consequently set himself to obtain pure cultures of the fixing bacteria by the usual bacteriological methods. Inasmuch as the different leguminous crops require, as we have already explained, either separate organisms or else different modifications of the same organism, Professor Nobbe has prepared a large number of pure cultivations suited for the commoner leguminous crops grown. These cultures are preserved in glass bottles containing *agra-gelatine*—a commonly used developing medium—and are of eight to ten ounces' capacity. They have to be kept from the influence of the light, and care must be taken not to expose them to a temperature above 98 deg. Fahr. Inoculation of a soil with these cultures, on a practical scale, may be effected in either of two ways. First, the seed of the crop it is desired to inoculate may be inocu-

* Nitrogen, it may be mentioned, for the benefit of those unacquainted with the science of plant-physiology, is for many reasons one of the most important of all plants-foods. It may be described as the regulating factor of plant growth; and the question of its supply, in forms suitable for assimilation by the plant, is, for the farmer, of the highest economic importance.

* The experimenters referred to are M. Boussingault, Sir J. B. Lawes (of Rothamsted) Sir J. Henry Gilbert, and Dr. Pugh.

lated before it is sown. This is effected by making a watery solution of the pure cultivation, immersing the seed in it, and subsequently drying it; or secondly, it may be effected by inoculating a quantity of fine sand, or earth, in the same way, and then spreading it over the field and subsequently working it into the soil to a depth of about three inches.

Naturally, a point of considerable interest is the economic question of the cost of such treatment. It is interesting to learn that this is extremely moderate, as the expense of inoculating a field in this way amounts to the very modest sum of five shilling per acre. This cannot be regarded as expensive, and contrasts favourably with the expense of nitrogenous fertilisers. No doubt there are many points in connection with this interesting discovery which can alone be answered by the test of experience. All that we can at present say is that it seems to promise great things for agriculture. It furnishes another example of the beneficent functions discharged by micro-organic life, which is in pleasing contrast to those performed by the disease-producing germs. Not more than a year ago the general application of the principle of soil inoculation was talked about as likely to be made in the future; now it is within measurable distance.

C. M AIKMAN.

On reading the above we referred it to Mr. John Hughes (Consulting Analytical Chemist to the Planters' Association) for his opinion and Mr. Hughes—now as at all times ready to help Ceylon industries—has been good enough to reply as follows:—

"As regards *Nitragin* or the use of bactoria for leguminous crops I fear it will not apply to tea or coffee.

"You will understand that leguminous crops have been known for many years to have the property of assimilating free nitrogen from the atmosphere.

"In 1886 Hellriegel discovered that this was brought about by means of nodules which form on the roots of such crops. These nodules contained bacteria which could be specially cultivated and when associated with the *seed* or *soil* of a field tends to increase the growth of leguminous crops in soils which would otherwise not produce these crops in economic quantities.

"Of course as this peculiar development of bacteria would only produce an increase in leguminous crops, it cannot apply to other kinds of crops. Thus it would be *no use* applying the bacteria generated from nodules on the roots of leguminous crops for the purpose of increasing the growth of other crops. Hence I don't think planters can expect any benefit from the discovery."

It seems clear, unfortunately, therefore, that Ceylon planters cannot profit by "Nitragin" as at present described; but are there not leguminous crops of importance to the natives in the lowcountry, which may well be brought within the scope of the discovery? This will be a matter for the intelligent head of the School of Agriculture in Colombo to take into consideration, and we feel sure that Mr. Dricberg will not be behind in making experiments, nor in making the result known for the benefit of the community.

J.F.

## PLANTING IN TRAVANCORE.

In the extensive area of land owned in the Kanan Devan district by Messrs. Finlay, Muir & Co. nearly 1,500 acres have been or will be planted in tea during the present (the South-West) monsoon. This looks as if labour was fairly plentiful. A small area has also been planted in Arabian coffee. The work is under the supervision of Mr. Milne, late of Warwick estate, whose headquarters at present are in the Munaar Valley.

## TEA IN MELBOURNE.

Sales include 300 chests of Ceylon at 9d, 200 half-chests of Pauyongs at 6d to 7¼d, and 70 quater-chests of S. O. P. at 8½d; 500 quarter-chests Kaisow buds. At the auction on the 13th August 3,153 packages of Indian were offered, of which 632 packages were sold up to the following prices:—For Darjeeling Pekoe 7d; Darjeeling souchong 6d; Darjeeling pekoe f. 5¾d; Darjeeling orange pekoe 8d; Darjeeling pekoe souchong 6¼d; Assam pekoe 9½d; Assam orange pekoe 10½d; Assam pekoe souchong 7¼d; Cachar pekoe souchong 6½d; Cachar souchong 6d; Terai orange pekoe 11d; Terai pekoe souchong 7¼d; Dooars pekoe 10½d; Dooars pekoe souchong 7d; Kumaon orange pekoe 7¾d. Biddings were not brisk, and the bulk of the lots submitted were withdrawn. At the auction sales of Indian held on the 18th Aug. buyers' ideas of value were not as a rule in harmony with those of importers; hence a large proportion of offerings were withdrawn. In all 1,172 packages were submitted, and 592 packages sold, Terai pekoe up to 6½d; Dooars pekoe 6¾d; Dooars orange pekoe at 8½d; Assam pekoe souchong 8d; Assam orange pekoe 11d; Assam pekoe 11½d; Cachar orange pekoe 9¼d souchong 6¾d; pekoe 8d; and fanning at 6¾d.—*Leader*, Aug. 27.

## TEA.

Glasgow, 15th Aug. 1896.

SIR,—Your correspondent, Mr. Jas. Barlow, seems to know very little about the tea trade, and is evidently under the impression that the grocers are making large fortunes. I will enlighten him a little on the subject. Take his last quotation for an illustration, namely, Ceylon, 6 to 6 13-16ths; that is what is called in the trade short price. Add your 4d per lb. of duty and ¼ per cent, then the carriage from London, which amounts to a ¼d per lb., a total of 10¾d to 11½d. Now, he will buy that class of tea in any first-class grocers at 1s per lb. I have an old official London list before me dated 9th May 1896. The prices range from 3½d to 1s 10d per lb., duty, and ¼ per cent over and above. If your correspondent watches the London markets, he will find quotations as high as 3s to 4s per lb., short price. I think the above is quite sufficient to set your correspondent's mind at rest. If he still thinks that there are such large profits I would advise him to start a shop, and he will find if any trade is cut keen, it is the grocery trade. To say that he can only get fair tea at 2s per lb. is absurd, as he will get a fair tea at 1s 4d per lb. from any first-class grocer.—I am, &c., TEA MERCHANT.

Glasgow, August 15, 1896.

SIR,—Mr. James Barlow and the public in general seem to look on the tea world as a world of mystery. As one who lives by it, and unfortunately has a great deal of tasting to do, I would like, had I the ability to write down my thoughts, to bring the question down to the level of the ordinary untrained mind. Common Congue tea is the cheapest put on the market, and can be had wholesale in Glasgow at about 4¾, on which you have to pay 4d per lb. of duty, and carriage from London. This tea is not sold retail in Glasgow. Indian is 7½d to 8d short price (that is without duty and carriage); Ceylon 6d to 6¾d S.P. From many grocers you can buy Indian, Ceylon, or Indian and Ceylon blended at 1s, duty paid, retail. This tea is fairly strong, sweet and quite palatable. At 1s 2d and 1s 4d D.P. you can get a finer grade of the same class of teas. These teas are good enough for anybody who wants strong tea with a fair flavour In fact, it would please anyone who has a plain, ordinary palate. Teas that are sold retail from 1s 6d to 2s are on the same lines as the 1s 4d, but are finer in quality, thicker, and have more flavour. I might say in passing that teas from 1s 4d to 1s 6d are the best value in the market. The reason is that the great tea estates in India and Ceylon produce greater quantities at this than any other price, hence the wholesale buyer has a large selection to choose rom. But I would like you to understand that there

are tea drinkers and tea drinkers—people that are pleased with cheap tea know nothing of the pleasure of a good cup of tea. If you would excuse a vulgar comparison I should compare tobacco and tea. The man that smokes a fine delicate cigar could not tolerate the flavour and strength of common twist, nor could the great mass of men, who enjoy their smoke of common twist, be bothered with the delicate cigar; they want something that will pinch the tongue. In the one case the palate is cultivated, in the other destroyed. The smoker of common twist has so destroyed his palate that if the tobacco does not bite his tongue he does not enjoy his smoke. It is the same with tea. You can take my word for it; if you give the price your grandmothers gave you will get the tea they drank. A fine tea is one full of flavour, quality, strong and juicy, and can't possibly be had anywhere under 2s 6d to 3s per lb. retail. I hope I have cleared the air for Mr. James Barlow and others.—I am, &c., *Glasgow Herald*, Aug. 8. YOUNG HYSON.

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## NOT MADE IN ASSAM.

No. 27 of the "Aricultural Ledger" is an exceptionally interesting one. It contains a review by Dr. George Watt, Reporter on Economic Products, of the recent correspondence on the Letpet tea and the tea plant of Burma. The number may be said to summarise the arguments that have been used on one side and the other with reference to the connection of the Burma plant with that grown and cultivated in Assam. Mr. C. W. A. Bruce, writing on the subject last year, stated that "all the extensions of the Assam gardens have been planted with Chindwin seed for the last ten gears at least." Commenting on this Dr. Watt questioned the accuracy of the observation, unless Cachar alone was referred to by Mr. Bruce. The new tea gardens and extensions of the past ten years were, he continued mainly in the so-called "Indigenous Assam" obtained from the Assam tea-seed gardens. Dr. Watt's opinion was subsequently borne out by that of Mr. J. Buckingham, Chairman of the Assam branch of the Indian Tea Association, who wrote: "Some Chindwin seed may possibly have come in to Assam under the name of Manipur Tea-seed, but I think I am within the mark in saying that certainly under ten per cent, probably not more than five per cent, of the clearances have been opened out in the Assam valley with this seed."

The weight of opinion would, therefore, appear to be decidedly against the Assistant Conservator of Forests in Upper Chindwin on this important point, and his other statement affecting Assam, namely, that there is no indigenous (wild) tea to be found in the country west of the Irrawaddy, is also subject to criticism. This, of course, touches on the old controversy as to whether tea is indigenous to Assam. Dr. Watt sums up the matter by saying, "All writers are agreed that it is indigenous to the tract of hilly country that constitutes the border land of Assam and Burma with China." The methods of preparation employed by the natives of this country may, Dr. Watt thinks, interest as well as amuse planters on this side of the Irrawaddy. At the same time he would not be surprised if the system of steaming the leaves were found adaptable to the European method of manufacture. The following description of the Shan process is given by Mr. W. A. Graham, who, when he speaks of "Leppet" tea, probably, means "Letpet." The word by the way, is said to be a corruption of "Let-tit-pet," meaning one hand, the fanciful name given to the preparation from some legend associated with its introduction into the Shan country. Mr. Graham tells us that the "leaves, while still green, are boiled in large, narrow-necked pots made for the purpose. When thoroughly boiled the contents of the pots are turned into large pits dug in the ground. These pits are square, and about six feet deep; the sides and bottom are lined with thin walls of plantain leaves, which keep the tea pure from contact with the earth. The pit being full of boiled tea and the juices from the pots, a top made of plantain leaves is placed over it, and earth is piled above it, big stones and other heavy weights being finally placed on top." For some months the tea remains in these pits, being thus preserved. Then when the trading season comes on the pits are opened, and the tea is sold to traders who convey it by bullock caravan to the market at Mandalay. The tea loses weight in transport, but this circumstance is compensated for in a very simple way. On nearing the market the traders throw the baskets for a day or two into the nearest stream. The article regains its lost dampness, and the weight is the same as when it was originally purchased. Mr. Graham adds that in Upper Burma and the Shan States this tea is largely consumed as a drink, but that in Lower Burma it is eaten. "Leppett," he says, is a traditional food among the Burmans, playing an important part in ceremonies connected with birth, marriage and death.

Mr. J. C. Murray, Deputy Conservator of Forests, Mu Division, says the practice is to steep the leaves in boiling water for a short time only. The leaves are then taken out, and, after being rolled by hand on mats, are allowed to cool. "The next process is to ram the leaves down right into the internode of *wabo* bamboo, a wooden ramrod being used for the purpose. A stopper is then made of jack or guava leaves, and the bamboos with the *letpet* are stoppered up." Ashes are put in at the top of the bamboo in order to prevent insects getting to the *letpet*. The people in these parts are, it appears, very badly off, and cannot afford to keep the *letpet*, but sell it for what it will fetch—which no doubt accounts for the fact that *letpet* from the Shan Hills east of the Irrawaddy sells for double the price of the Maingthon *letpet*. The villagers attribute the superior price of the one article to the fact that the Shans east of the Irrawaddy steam the leaves while those on the western bank boil them. The latter have, of course, a traditional reason for employing the boiling process. About three centuries and a half ago a Shan woman who had married a native of the trans-Irrawaddy district, was about to accompany her husband to his home when some neighbours observed that she was carrying off a number of tea seeds. It was seen that if tea culture were introduced on the western side of the river the Shan industry would have to face an undesirable competition. The woman was, therefore, only allowed to take the seeds away on giving a promise that any tea made on the western side should not be steamed, but boiled. She took an oath to this effect, and called down curses upon the head of anyone who broke the undertaking. The people on the west bank, therefore, boil the leaves to this day, under the impression that if steaming is resorted to it will be the worse for them. These are only a few of the many interesting features of Dr. Watt's latest paper.—*Englishman*, Sept. 1.

## THE NEW DIRECTOR OF THE ROYAL BOTANIC GARDENS.

Dr. Trimen's successor will be well on his way to Ceylon before these lines come before our readers. Mr. Willis was to have left London by the Orient ss. "Orotava" on the 21st August. We have had some pleasant correspondence with Mr. Willis; but were unable to meet him in London before his departure. At Cambridge, however, where Mr. Willis is well-known and much esteemed, we learned a good deal about the new Director, and all telling in his favour as a practical as well as scientific Botanist, and one well-fitted to do justice in the responsible post he is called on to fill for the Ceylon Government and public. After a distinguished career at the University Mr. Willis went to Glasgow where he has given great satisfaction in his post as Botanical Assistant at the University and very much extended his experience and knowledge. Mr. Shipley, Science Lecturer, connected with Christ's College, Cambridge, spoke in high terms of Mr. Willis, and told us about a very useful Pocket Cyclopaedia of Botany (to be published in connection with a series of which, we believe, Mr. Shipley is editor) for the compilation of which Mr. Willis is mainly responsible. Mr. Shipley, in fact, was expecting final "proofs" back from Naples. Professor Marshall Ward who knows well, from personal experience, the kind of man wanted at Peradeniya, had only good to report of Mr. Willis and his fitness to succeed Dr. Trimen. He thinks Mr. Willis's Encyclopaedia will prove a ery useful little work, and its value had, possibly, something to do with the appointment to Ceylon. In economic matters, there is every likelihood of Mr. Willis proving equal to the occasion; while he will certainly do all in his power to get quickly acquainted with local conditions and requirements. Finally, some one remarked to us in Cambridge:—"Do not make a mistake through Mr. Willis's apparently juvenile appearance, because he *looks* like 19 or 20, in place of his 28 to 30 years." Mr. Willis is in attainments and experience quite up to his years; and long may he retain his youthful appearance, say we, although we daresay Ceylon will soon effect a change. At any rate, no one in the island is likely to take objection on the above score; and we bespeak for Mr. Willis a hearty welcome on the part of the Ceylon public and especially the planters, as well as from his official superiors.

J.F.

## THE "MAZAWATTEE" TEA COMPANY.

At the present time there are tea companies without number. Almost everyone drinks tea—in point of popularity it stands head and shoulders above every other beverage. Next to tobacco, indeed, it yields the largest customs revenue. Speaking roughly, the country makes about £5,000,000 off tea every year, spirits coming next, and wines next.

Mr. John Lane Densham is verily a King of commerce, since he shares with his brother the task of ruling ever the destinies of the "Mazawattee" Tea Company. The house of Densham—started by Mr. John Densham's father thirty-three years since—is an old and respected one. For years the Denshams sold tea and coffee (wholesale) just like anyone else, but 12 years ago they were struck by the quality of the tea which came from Ceylon. They were the first of all their fellows to recognise what Ceylon might develop into as a tea-growing country.

THE ORIGIN OF "MAZAWATTEE."

So, selecting the yields of the best Ceylon gardens only, and allying them with the choicest teas of India and China, they obtained a blend of ex-



ceptional value, exquisite in flavour and aroma a blend grateful to the palate, and of uniform strength and quality, which they called "Mazawattee" (pronounced "Mazawotty.") Advertised right and left, and pushed with the greatest vigour "Mazawattee" soon became the best-known tea in the three kingdoms, to say nothing of the principality of Wales.

"Mazawattee" caught on. If it had been a bad tea people wouldn't have paid the price demanded for it, no matter how much it had been advertised. The public soon distinguished between a commodity that is of real, and a commodity that is only of meretricious, value. But the Denshams' blend was good.

"The Ceylon tea-planters," said Mr. John Densham to the writer, "look upon us as the best friends they ever had. Our action, you see, caused a revolution in the tea trade. The China trade is now as near as possible (so far as the English tea trade is concerned) a dead letter. Some old stagers drink China teas but the rising generation hardly dreams of touching them."

Mr. Densham here got out a great ledger.

A FEW FIGURES.

"I want to show you a few figures," he said, "which will prove to you how wonderfully the consumption of Ceylon tea has increased since we first drew the attention of the public to it. In 1884-85 Ceylon exported 2,500,000 pounds of tea, and China 139,000,000 pounds. In 1894-95 Ceylon exported 74,000,000, and China only 46,000,000 pounds. Thus, in ten years, the consumption of Ceylon tea has increased by 72,000,000 pounds, while that of China has decreased by almost 100,000,000 pounds."

From which figures it is evident that if the Messrs. Densham went out to China as missionaries their lives would not be worth many moments' purchase.

"And where," we enquired, "does the discarded China tea find a home"?

"The best of it," was the reply, "goes to Russia, the inferior sorts to other European countries, and the commonest of all to Canada and Australia."

WHAT THE NAME MEANS.

"How did you come to fix upon the name 'Mazawattee'"? was our next question.

"It is a curious jumble formed from several Cingalese words," explained Mr. Densham; "it is meant to denote *a standard high-class brand*. I need hardly tell you that from the very commencement rival merchants have been endeavouring to copy it. We are constantly opposing names which bear too great a similarity of ours. Among imitations that we have had to squash are Myawattee, Nysowatte, Mallewattee and Gammaza. We had to stop the last-named because to the trade our tea is largely known simply as 'Maza.'"

Asked to supply the names of any famous folk whom he supplies with Mazawattee, Mr. Densham explained that in order to do this he would have to send a circular letter to his agents, "since ours is an entirely wholesale trade. But," he added, "I can tell you this, and you can take it for what it is worth. Our agent at Hawarden only sells Mazawattee. I mustn't commit myself. *Mr. Gladstone may or may not drink us.* How can I say? I can at any rate," he went on, "testify to the fact that at least one member of the Episcopal Bench drinks 'Mazawattee,' for not very long ago we received a visit from the Bishop of Gloucester who told us that when at home he invariably drinks our 'four-shilling' tea, and so, when he came up to London and found that he could not get it at his hotel, it struck him the best thing he could do would be to come and buy some himself. Of course we would not hear of his paying for any, but, later in the day, sent him a present consisting of a 6lb. tin of his favourite blend. Our 'four-shilling' tea, I should tell you, is very popular. Curiously enough, we send an enormous quantity of this tea to such wide apart places as Finland and Cape Colony."

£25 10s. Per Pound.

Mr. Densham has still got some of the tea which the company gave such a fancy price for a few years ago.

By way of satisfying our curiosity he took a square wooden box out of his desk, and opening this, displayed to our view a very fine, light, golden-brown blend of tea, with an enchanting aroma. "Only twelve pounds left now," he said. "We bought fifty pounds of it at £25 10s. per pound. Most of it we sent about in small quantities to our agents for 'exhibition' purposes. After great pressure for a sample we sold half-a-pound of it to an Australian merchant for £15."

Mr. Densham next touched on the pictorial advertisements which have done so much towards making "Mazawattee" a household word. The majority of these have been executed by well-known artists—among them Fred. Morgan, G. Sheridan Knowles, R.I., and Ambrose Dudley. Who is not familiar with the picture of the dear old lady drinking her "Mazawattee" by the side of a great-grandchild who has mischievously donned her aged relative's spectacles? Another famous Mazawattee picture is borrowed from the "Vicar of Wakefield," and represents Olivia showing her mother the love-knots in her cup. The fact that Mazawattee Tea recalls the delicious blends of thirty years ago is so well-known that Mr. Densham quite apologised for introducing the fact into his conversation.

80 TONS PER DAY.

One might ramble, during the whole of an absorbingly-interesting afternoon, through the famous Densham warehouses on Tower Hill. The walls are of an astonishing thickness. There are eight floors to the warehouses. On one we watched the great revolving mixers, each capable of holding about a ton of tea; lower down were gigantic reservoirs into which the blended tea passes after having been thoroughly mixed above. In close proximity to the reservoirs long lines of boys ("we do not employ a single girl in the whole place," explained our guide), were filling tins and packets with a rapidity that clearly manifested that they were "paid by the piece." Still lower, the engine-room presented a wonderful sight. Three enormous gas-engines, capable of producing something like 110 horse power, are used for turning the "mixers" which are studded all over the building. When the tea-mixers are running at full loads their capacity for blending is something like seventy to eighty tons of tea per day.

A special block of the massive Tower Hill warehouses is laid out for "Mazawattee coffee." The extensive coffee "plant" is driven by electrical power.

The "Mazawattee" printing works are situated in East Smithfield, and the offices proper are in Eastcheap. The "Mazawattee" *employés* compose quite a formidable army, and it is hardly necessary to point out that the generals commanding it are two of the clearest-headed men in this London of ours.—*Success*, Aug. 15.

## PALLEGAMA GRANT ASSOCIATION OF CEYLON, LIMITED.

The ordinary annual general meeting of the Pallegama Grant Association of Ceylon, Limited, was held today at noon, in the office of the Agents and Secretaries (Messrs. Buchanan, Frazer & Co.). The Hon. W. W. Mitchell, presided and present were:—Messrs. E Rosling, A. Rosling, D. R. Buchanan, W. Bowden-Smith (representing W. S. Bennett) and Mr. Gordon Frazer as a shareholder and as representing the the Agents and Secretaries.

The SECRETARY (Mr. Gordon Frazer) read the notice calling the meeting, and minutes of last ordinary meeting, which latter were confirmed.

THE DIRECTORS' REPORT.

The CHAIRMAN submitted the report of the directors for the past year which is in the following terms:—

The Directors have pleasure in submitting the balance sheet and profit and loss account to 30th June 1896, duly audited.

During the past year 210 acres have been felled and planted, which brings the total area now under cultivation up to 503 acres.

The growth of liberian coffee and coconuts is encouraging, although depredations by wild animals still continue to give some trouble.

The Directors and the Agents and Secretarys have agreed to waive their fees for the past year.

In terms of the articles of Association all the Directors retire, but being eligible, offer themselves for re-election.

The meeting will also have to elect an Auditor in the place of Mr. J. Guthrie, who retires, but is eligible for re-election.—By order of the Directors,

BUCHANAN FRAZER & Co.,
Agents and Secretaries.

Colombo, 15th August 1896.

In moving the adoption of the report, the CHAIRMAN said:—As the report has been in the hands of the shareholders for some time, and as it is not a very long one, I presume it may be taken as read. I cannot say I have very much to add to the information that has been given in the report, but, with your permission, I will read extracts from a report of the Superintendent of date 5th September, which brings us well up to date:—

COCONUTS.—Individual coconuts have all been fenced in and are looking well. Plants in the "98 Acre Field" are much more sturdy than those in the "North East Field." The reason for this is that they were younger plants when put out, neither had they such heavy shade in the nursery. There are, I regret to say, many vacancies, but with careful supplying and fencing in, I hope to have those clearings even by the end of the year. It is useless planting coconuts down here unless they are fenced immediately they are planted, otherwise wild animals will not give them a chance. During the drought watering has been resorted to in some parts of these clearings, principally in "The Bungalow Field."

LIBERIAN COFFEE.—I am pleased to say that "The Forty-five-acre Clearing," planted in November and December last, has stood the drought well without being watered and looks most promising There are very few vacancies. In the best parts the plants are from 18 inches to 2 feet high. The growth is not so good in the hollows, but will greatly improve when they are drained, which work I hope to commence next week.

CACAO.—This product has not stood the draught well, but, having been constantly watered, it has pulled through. Taking the 13 acres all over, I should say there were 30 per cent. of vacancies. The "Four-acre Field" is decidedly the best, most of the vacancies being in the nine acres.

NURSERIES.—1½ bushels of Liberian seed has been received from Wiharagama estate, and is now in the Nursery. This I expect to be ready for planting out in November. 6,181 coconuts are in the nursery to date and 6,400 more are now on the way down from Rattota. Till within the last fortnight, I have not been able to induce the Matale or the Rattota carters to cart to Leloya, and the tavalams all having had murrain the transport of these nuts has been delayed a month and the nuts that are now arriving would not be ready for planting out, at the earliest, before the end of December.

TIMBER.—A contract has been given out for the felling, squaring and transport of 100 tons of ebony delivered in Matale. About 30 tons are now ready to be transported and I am expecting the carts down daily.

I do not know I have anything else to add beyond pointing out to the shareholders the exceptional difficulties that have had to be contended with in opening new land in such a district, so inaccessible, and where the difficulties of transport are so great. We have every reason to believe that Government will render substantial assistance this year in bridging the culverts between Pallegama and Elleheira, and also we are looking forward to having a ford constructed over the Ambanganga. This is a river in flood at certain times of the year and at other times with hardly any water in it at all, and the Director of Public Works believes a ford would

be least expensive, and most suitable, in the meantime, at all events; and I can only hope that Government will see their way to expend some of the money that has been indicated as the cost of the ford. With these few remarks, I beg to move the adoption of the report.

Mr. W. Bowden Smith :—If this is the proper time for asking questions, and I am not out of order I should like to ask one or two questions: first, as to whether the district has become more healthy now it has been opened up; and second, as to whether there is any improvement in the labour supply.

The Chairman :—I am glad to say the district has become much more healthy. All the superintendents we have had—and we have had a number before the present one—were being constantly laid down with fever and had to be removed. The Superintendent who is now there, and who has been there for a considerable time, I believe I am right in saying, has not had an attack of fever.

Mr. W. Bowden Smith :—I suppose since it has become more healthy the labour supply has improved?

The Chairman :—The labour supply is fairly good and we have enough for our requirements. There have been only three deaths during the last year.

Mr. W. Bowden Smith :—It is wonderful that it is so healthy. I gave it about four years before it would have become so healthy a place. I shall be happy to second the adoption of the report.

Mr. E. Rosling :—I may mention that one of the three deaths in the labour force was due to a hospital falling down. That was hardly due to climatic causes.

By W. Bowden Smith :—There is no tea planted there at all, I presume it is chiefly coconuts. The report does not show what the acreage planted in different products is. I think it would be an improvement if the report gave the acreage of each crop. It is valuable information to the shareholders to know how much there is of each product.

The Chairman :—That is a matter that will receive attention. We have had a good deal of trouble with wild animals. We have had to fence in almost everything and their depredations have become a regular pest, though, I suppose they will be got rid of in time (Continuing) the Chairman said :—Mr. E. Rosling has supplied me with the information necessary to answer the question regarding the acreage under different products. In coconuts there are, approximately, 393 acres; in coffee 94 acres; and in cocoa 13 acres.

The report was then formally adopted.

RE-ELECTION OF DIRECTORS.

Mr. Bowden Smith :—I have much pleasure in proposing the re-election of the retiring Directors :—The Hon. W. W. Mitchell, Mr. E. Rosling, Mr. E. Gordon Reeves and Mr. A. Rosling.

Mr. Gordon Frazer :—I second the motion. The retiring Directors were re-elected.

APPOINTMENT OF AN AUDITOR.

The Chairman :—The next business is the election of an auditor. Mr. John Guthrie is the only applicant for the post.

Mr. Gordon Frazer :—I propose that Mr. Guthrie be appointed auditor for the current year at the usual fee of R100.

Mr. A. Rosling seconded, and the motion was unanimously adopted.

A vote of thanks to the Chair, proposed by Mr. W. Bowden Smith, terminated the proceedings.

## THE GOVERNMENT CINCHONA PLANTATIONS IN MADRAS.

The Administration Report of the Government Cinchona Plantations in Madras for 1895-96 is of particular interest, for in the first place it is a record of the first year when the whole output of the quinine factory was disposed of—in fact, more than disposed of, former stocks of the sulphate having to be drawn upon; and, secondly, appended to it is the Report made on these plantations by Brigade-Surgeon Lieutenant-Colonel W. G. King last year, a summary of which is given on another page. As a good deal has been written in our columns concerning the appointment of Mr. Standen to the Directorship of the Cinchona Plantations—or the Cinchona Department as it is now called—Dr. King's views in the matter are of interest. It must be remembered that they were written over twelve months ago in the prospect of the late Mr. Lawson's retirement at the end of the official year. Dr. King, having laid down that the officer selected to succeed Mr. Lawson should be an educated man, with a sufficient knowledge of agriculture and horticulture, both theoretical and practical, proceeds to say :—"It might and I dare say would be impossible to get a man with a special knowledge of cinchona cultivation;" clearly meaning that if such a man, suitable in other respects, were available, he would be the right person for the post. Knowledge of the culture of cinchona, Dr. King considered to be more necessary for the new Superintendent than a knowledge of chemistry. He further wrote :—"One qualification which the Superintendent of these plantations should most certainly possess is a capacity for estate management and for the organisation and control of labour." From these remarks it will be seen that the Madras Government, in appointing Mr. Standen to the Directorship, was only following the advice given by the Government expert specially deputed to report on the subject. Mr. Standen's qualifications tally with every one of those specified by Dr. King, who, moreover, deemed it a most important point for the future management of the plantations to secure a continuity of policy. This was also assured by the appointment of the present Director. For many years he had been a near neighbour and close friend of the late Mr. Lawson; he was acquainted with his methods of work and knew his views and opinions regarding the administration of the plantations. We remarked some weeks ago that the appointment of Mr. Standen was an admirable one, an opinion which we now find fully confirmed by Dr. King.

Some interesting information regarding the financial result of the working of these plantations is furnished by Dr. King. It appears that according to the Accountant-General's calculations, the total cost of the estates, plus annual interest at 4½ per cent., amounted to Rs. 13,04,360 at the end of the official year 1875-76. During the seven succeeding years such large quantities of bark were sold in England that the surplus of receipts over expenditure totalled in round numbers R18,39,000, so that at the end of 1882-83 there was, after fully allowing for interest, a surplus of R5,34,640. After this date a steady loss resulted. The net receipts for the next twelve years, ending 1894-95, fell short of the expenditure by R2,81,644, so that on the 31st March, 1895, the balance in favour of the Cinchona plantations was reduced to a little over 2½ lakhs. Dr. King, we notice, proposes to write off R2 lakhs of this credit balance for

interest during these twelve years, though by what manner of book-keeping any interest can be shown to have accrued in this period when a large sum was continuously standing to the credit of the plantations, we fail to understand. The estates should have been earning a considerab'e sum of interest on their unexpended balance all this time. The Madras Government has apparently accepted Dr. King's figures. Whether we write off these R2½ lakhs profit as due for interest or let them stand as clear profit does not signify, for this important fact remains. On the 1st April, 1895, Government owned, free of all cost and charge, 800 acres of cinchona, a quinine factory in good working order, to say nothing of bungalows, stores, cooly lines, tools, cattle-grazing grounds, &c. "The estates," wrote Dr. King, "are in my opinion a valuable property." The property in itself, quite apart from the cultivation and factory, we may add, is very valuable. At any moment now Government can capitalise and retire from the active life of a cinchona planter and quinine manufcturer, with a comfortable little sum to its credit, gained in this very unconventional branch of administration. We do not desire Government to retire at the present time; but we do wish to most distinctly emphasise that it is in a position to retire at any time now to its pecuniary profit.

We have already mentioned that the sales of quinine during the year under review exceeded the output of the factory. The actual amount sold was 5,644 lb. sulphate and 2,666 lb. febrifuge, against 3,600 lb. and 2,284 lb. in the previous year. These figures are most satisfactory and bear eloquent testimony to the splendid way in which the late Mr. Lawson had worked up this branch of the business. We merely record these figures here; Government issues a paper annually detailing the manner in which its quinine is distributed, and when this comes to hand we shall have an opportunity of going more fully into the figures. In the Administration Report, the full value of their sales is credited in last year's accounts although the output of the factory fell short of the sales by some 2,000 lb. of sulphate and 400 lb. of febrifuge. Naturally a profit is shown, which is set down at R26,135-2-8, Government in its order, states that it "notes with satisfaction that the net result of the operations (during the year under review) was a gain of about R26,135." This does not say much for Government's criticism of the figures. We will give exactly the net results of the operations in 1895-96. The amount of bark harvested was 229,700 lb., the amount treated in the factory was 233,800 lb. For all practical purposes we may say that the whole of the year's harvesting went through the factory. The result of this was 3,600 lb. of quinine which realised R53,600, this after making due allowance for the proportion sold to Government institutions at R14 per lb. and to private parties at R16 per lb. There were also manufactured 2,284 lb. of febrifuge, value R22,840; so the total value of the year's output from field and factory was R76,440. The expenditure for the year aggregated R82,560, consequently the net result of the operations was a loss of R6,120. We are fully aware that it is possible to argue that extraneous circumstances accounted for this small deficit. At the same time, we do not believe that any explanation can be forthcoming to show how this deficit could be turned into the substantial profit, which, regarded from a commercial standpoint, should have resulted. Government occupies the dual position of cinchona planter and quinine maker, and in both cases is situated almost favourably. As cinchona planter, it is able to dispose of the whole of its produce straight from the field. There are no transport expenses, or expenses for baling and shipping; freight, marine insurance and London charges are also saved, and Government's margin of profit is consequently far larger than the ordinary planter's. In a similar manner as quinine-maker it is spared all the expenses on the raw material between the market and the factory, and it is moreover able to dispose of as much of the manufactured article as it turns out at the same wholesale price as Messrs. Howard and Sons. We do not write with any technical knowledge of quinine making, and it may be that the utilisation of waste products and the facilities for obtaining chemicals places a European factory in a more advantageous position than one in India. But the fact remains that a concern, able to do without the middleman either in the purchase of the raw material or sale of the manufactured article, and situated close to its source of supply and in the centre of the markets it feeds, occupies a most favourable position. Presuming that Government pays no more for its bark than do the London and continental manufacturers, there should be a large profit annually on its operations.

The accounts furnished with the Administration Report are tabulated in such a manner as to supply the least information possible to the outside public. Were these plantations the property of a private Company, the accounts of cultivation and of manufacture would be kept separately, and establishment and superintendence fairly apportioned between the two. This item is and has been an exceedingly heavy one, and in the year under review out of a total expenditure of R82,560, no less than R34,429 appears under "establishment including Superintendent's salary." Now that the appointment of Government Quinologist has been abolished this expense will be lightened but it will still remain heavy. The one thing we wish more particularly to know is what does the factory pay for its bark per unit? The figures we have quoted seem to point to a considerably higher price than the one ruling in the London market, or, to put our meaning in other words, there is reason to believe that Government can buy its bark cheaper in the open market than it can grow it. That this is not unlikely may be gathered from the fact that Mr. Lawson considered two-fifths of the plantations hardly worth cultivating, and Dr. King confirmed his view. Theoretically Government has no more right to cultivate cinchona and make quinine than it has to grow barley and brew malt-liquors. Practically the two cases are not on the same footing, and so long as the quinine is distributed among a fever-stricken population, who could not otherwise obtain the drug, so long, we maintain, is Government justified in its action. But at the same time the work must be carried on on strictly commercial principles, and the annual accounts ought to be drawn up in the same way as though the undertaking were in private hands. The most important work in the future will lie in the field rather than in the factory, and requires the services of a practical planter. The art of successful planting lies in obtaining the maximum crop with the minimum expenditure without any deterioration of the plant. To this end a planter continually works and it is only long experience that ensures success. Unless the very closest supervi-

sion is maintained over the cultivation for the next few years we shall either see the plantations kept up at a cost which entails an annual loss, which is not justifiable, or else neglected with the result that there will be a serious deterioration in their value, which would be deplorable. There is a happy mean between these two courses; we have no doubt about it; and we are equally certain that only a person experienced in the cultivation of cinchona will be able to pursue it so long as the market price of the unit of quinine remains at its present low level.—*M. Mail*, Sept. 4.

## RHEA CULTIVATION.

According to last years report of the Agri-Horticultural Society of India, the cultivation of rhea has been taken up extensively in Lower and Eastern Bengal, and on many tea gardens in Assam. No less than eighty-seven persons made three hundred and seventy-one references to the Society for information regarding cultivation, manufacture, and machinery, but the greatest secrecy has in all cases been maintained, both as regards localities where rhea is cultivated, and the markets to which the fibre is supplied. It is to be feared that many contemplate taking up the cultivation of the plant in very unfavorable districts. It is curious to note that the references now being made to the Society regarding cultivation of fibrous plants, etc., are identical with those submitted thirty and forty years ago. Some very fine samples of uncleaned, cleaned, and bleached ribbons and floss have been submitted. In some cases it has been mentioned that there are buyers in Europe of bleached ribbons at £45 to £50 per ton, and £30 per ton for degummed fibre.—*Indian Agriculturist*, Sept. 1.

## GERMAN SANDALWOOD OIL.

Whatever may be the excellence of German cider, it appears that sandalwood oil "made in Germany" does not meet with much appreciation in the East. At first, its cheapness brought it into some vogue in Western India; it seemed to be the right thing, and substantial profits accrued to its importers. But discovery was made before long that the scent had far less permanence than that of oil made from Mysore sandalwood. The latter lasts for years, and comes in very usefully to impart the peculiar perfume to other woods used in Bombay art work. There is, of course, something of fraud in that, but it is of very ancient origin, and only the guileless believe that article labelled "sandalwood" are always genuine. The enterprizing Teuton, however, apparently came to the conclusion that there was room for still further sophistication, and, acting upon that appetising notion, supplied himself with inferior sandalwood from other countries. Whether he added other ingredients may be left an open question; possibly, the knowledge of applied chemistry on which he prides himself, with such good reason, may have come to his aid in this matter also. At all events, it is officially reported by the Mysore Forest Department that the introduction of this German decoction diminished, for a time, the sale of the genuine article. But the latest report from Bombay states that the spurious oil has largely gone out of favour among merchants who have had experience of its inferiority, and we may take it, therefore, that imports will grow small by degrees and very beautifully less,—*Globe*, Aug. 22.

## THE CUTCH FORESTS OF UPPER BURMA.

The people of Upper Burma are beginning to realise what a mine of wealth lies in the cutch forests, and they run the risk of punishment by illicit traffic in the product. The last Forest Administration Report shows how cleverly the Burman works, and how lenient are the magistrates in dealing with him. He invariably sets up the plea that he has simply cut down cutch trees to make a clearing for cultivation, and, it is most difficult to obtain good evidence against him. In the Western Circle the number of offences is steadily increasing, and until forest reservation has been carried out on a large scale matters will continue in an unsatisfactory tate. The Conservator points out that the cutch exports from this circle are worth eleven lakhs per annum, and that the Government are losing a large amount of revenue owing to the widespread evasion of the regulations. Moreover, it is remarked that the people are now claiming as private land large tracts over which they never dreamed of asserting their rights before, and these claims, if not upset, are likely to give much trouble hereafter. It is suggested that the only effective measure would be the absolute prohibition of cutch-boiling on private land, until it has been decided what is private land and what is not. It is not only the villager who sets the law at defiance, but the licensee also. The demand for cutch is so great, and prices rule so high, that the men who take out licenses are tempted to make illicit profits. The forfeiture of bonds of R1,000 each has followed in cases of detection, and this should have a wholesale effect. The ordinary offender usually gets off with a small fine, if he is convicted at all, and this he pays quite willingly, as his gains are large. It would seem that the magistrates err on the side of leniency, and the cutchthief is encouraged in his evil courses. The Burmans give trouble also in the matter of forest-fires, and great efforts are being made to save valuable teak forests from damage due to incendiarism or to carelessness of people in camp. In the Minbu Division the forest staff have had an unpleasant experience, as the Tichaungwa reserve was twice ravaged by fire, and in one instance the villagers refused to give any help in checking the flames. There is evidently much to be done in Upper Burma before the forests can be properly protected, and the Government have acted wisely in increasing the establishment which can make protection real and effective.—*Indian Agriculturist*, Sep. 1.

Wanarajah Tea Company.—We heartily congratulate the shareholders upon receiving a dividend of 20 per cent for the past year, and trust that the returns may long continue to be as satisfactory as those which were presented at the meeting today. The directors are justified by results in having so much confidence in manuring, and it is to be hoped that the liberal outlay which they propose to continue to make on this work will prove as satisfactory as it has done in the past. The figures given by the Chairman are interesting and instructive as showing the progress that has been made in the field of crop, and the prospects for the future are very hopeful indeed, leaving out of sight, of course, the coffee yield which is diminishing at such a rate that it is expected to disappear altogether shortly. The estates are admirably managed, and the Company's affairs well looked after by the agents and secretaries.

## COFFEE PLANTING IN SOUTHERN ASIA AND THE NEED OF IMPORTING "LADYBIRDS" TO CLEAR AWAY INSECT ENEMIES.

It was suggested in these columns very recently, that the comparatively few coffee planters or proprietors in Ceylon now-a-days should unite with their brethren in Southern India, the Straits and Java to commission Mr. Kœbele once more to visit Queensland and bring over another consignment of "ladybirds," the enemies of all varieties of "bugs" and other evils on coffee. It was pointed out that the importance of taking care that no parasites accompanied the tiny bug-eaters, almost necessitated the employment of some one as experienced and skilful as Mr. Kœbele, and he has clearly expressed his readiness to serve planters in Southern Asia as he has already done the fruit-growers of California and the planters of Honolulu. In a letter dated 14th August from Devonshire, Mr. E. Ernest Green supports the proposal as follows:—

With respect to your remarks on Mr. Kœbele and the ladybirds, I agree with you that we should find it difficult to raise by ourselves a sufficient fee to compensate Mr. Kœbele for his trouble: but I note in last No. (July) of *T.A.* that the Nilgiri planters are moving in the matter and petitioning Government for assistance in procuring the beetles. Could we not make a joint fund—which, with some possible added assistance from the two Governments, might make it worth Mr. Kœbele's while to help us in the same way that he has already helped the Californian fruit-growers and the coffee planters of the Sandwich Islands? As you suggest, Java and the Straits planters might join too? It is all on the way.

In another column will be found a communication from a correspondent adverse to the introduction of the ladybird, but in view of all the scientific evidence we have heard in favour of it, we are still inclined to the opinion that in the interests of "coffee," the Secretary of the Ceylon Planters' Association might approach the representative body of Southern India as well as those of the Straits and Java, to sound them as to co-operation in so eminently commendable an enterprise, and if the planters do their part, we may feel safe that the authorities will not be behind in giving some aid; while we might also expect the steamer Companies concerned to be specially liberal towards an undertaking, which, if successful, is calculated to revive and extend an industry that did so much for Eastern freights in days gone by. It only remains then that a start should be made, and obviously that ought to come from the Ceylon Association if Mr. Philip, under the sanction of his Committee can find time to add to his many good deeds by sounding the sister Associations in the other coffee countries named on this subject of a proposed mission for Mr. Kœbele.

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## THE LADYBIRD A HUMBUG.

(*By a Correspondent.*)

Notwithstanding the interesting comments of the absent editor, backed by a brace of specialists, I am very much disposed to think the ladybird is a bit of a humbug, and, for any practical purpose, valueless, for Ceylon.

This I say deliberately after several years' observation in Australia, where I saw more scaly bug than ever I found elsewhere in the world. That the ladybird feeds upon bug, plant-lice and other enemies of planters and gardeners everybody knows who has taken the trouble to study the habits of the pretty little creatures, but that their appetite is so voracious—or that they would multiply to such a degree as to clear Ceylon of green bug, seems extremely improbable. Of course the brief report of Mr. Kœbele that the few coffee trees in Honolulu are "now practically clean" looks encouraging, but we must not shut our eyes to the fact that from elsewhere we have the best authenticated reports of her ladyship's complete failure to answer the purpose for which she was introduced at considerable expense. Take the following from the *Ontario Observer*, May 30, 1896:—

While it has been given a fair opportunity to demonstrate its worth as a scale devourer, yet its failure has been sufficiently marked in this county, as to render its efficacy a matter for serious doubt. But it would be unwise not to give it every possible show to vindicate the claims of its friends, but pending such experiments the work of fumigation should be vigorously prosecuted in all infested orchards.

Then

Commissioner Van Kirk of Riverside county, in his annual report, says of the work of this ladybird in his district:—This parasite has been fostered and pushed upon the growers, with the understanding that as soon as colonized, they need have no further fear of the ravages of the black scale. Hence they have been given full sway in several sections and the results (where they have been depended upon entirely) have proved almost a failure on the orange trees. On the olive trees their work is more satisfactory, but is hardly sufficiently marked in any line to justify us in giving them any further consideration.

And finally read what the *Ojai* of July 4th saith:—

When the ladybird was introduced in the valley, it was proclaimed that we had secured an ally which, alone and single handed, would speedily remove the pest from our orchards. For a time the ladybird did her work with satisfaction. But she has gone off duty, with no immediate prospect of going on again. * * The ladybird is not the exterminator she has been "cracked up" to be. She does n't extirpate the fungus. She devours the precise number of scale that suits her appetite, and she then ceases to devour until a strange feeling comes over her and reminds that she is again hungry. * * We said formerly the ladybird to be worth her weight in gold. We still give her credit for being worth her "scale" weight in silver at 1 to 2. But we have become conservative in our opinion as to her ability to totally destroy the scale. She is an enemy of the scale and consequently our friend. We want to give her full credit for all she does. Yet we feel that, after all, she does only as much in the way of freeing our orchards of the scale as does the gopher snake toward removing from the earth the gopher, the cat the mouse, and the birds the insects. * * It is a duty each grower in the valley owes all the other growers to send the Board of Supervisors a sample of his schiography on that petition.

After which it will probably occur to the judicious planter that it would be unwise to incur any extraordinary outlay in that direction.

With regard to coffee leaf blight and its sequel green bug, my impression is that so long as there is a coffee tree in the island there will be leaf disease. If it were possible to pass an edict to stamp out every coffee tree and keep them out for a few years, then it might be re-introduced with some hope of success, as the fungus must die as did the potato blight when deprived of its natural food. Whether it would return again is another question. The occasional return visits of the potato fungus have never however been so serious as the first infliction in 1846.

Few have a greater respect and admiration for the labours of professor Marshall Ward than I have, but the question is did he suggest anything to "ward" off the disease?

The life history of *Hemileia Vastatrix* is all very interesting, but it is its *death* we most desiderate. The life history of influenza or smallpox would be of small accont without a suggested remedy, The poor Matabele chieftains as they struggle manfully against the British brigands might be interested to the life history of their enemies, but they naturally desire something more than this. They have their fly but that seems not sufficient to protect them. Neither will the ladybird save our coffee bushes. A poor result surely of all our boasted researches and resources if at this time of day all we can do is to simply place our implicit faith in a pretty little beetle!

## THE SUPPLY OF PEARLS.

When we speak of the profusion of jewellery at the present day we refer to diamonds. Other gems are scarcely more common than formerly, excepting those of a low class such as garnets, topazes, peridots. Fine pearls, they say, are not to be procured. Why does not Spain work that enormous bank which stretches hundreds of miles to the north east of Borneo, now that she has possessed herself of the Sulu Islands? Its wealth is beyond dispute. For ages it has been the last resource of ruined gamblers and desperate men who braved the risk of working there—upon the high road, as one may say of the pirates; and if they saved their heads they commonly retrieved their fortunes. "The pearl banks," says Sir Spencer St. John, "are perhaps more numerous there than in any part of the world, and if properly developed would no doubt be exceedingly productive." When Mr. Edwards was Governor of Labuan, he bought a pearl found there "which was pronounced by all who saw it in the East as the best that had ever been brought under their notice." Historic specimens have been traced to the spot. The terrible Labuan pirates are homeless wanderers now. The Sulus are subject of Spain. But, still, so far as we have heard, no European has visited those banks.—*Torres Straits Pilot*, Aug. 8.

## BETEL BLIGHT.

Dr. George Watt, who was deputed to enquire into the cause of the blight which attacked the betel plantation in Eastern Bengal, has completed an exhaustive Report on the subject, which will shortly pass through the press. He has ascertained that the blight is caused by a very low parasitic organism which by some specialists is considered an animal, by others a vegetable growth. No satisfactory remedy has yet been discovered.—*Madras Mail*, Sept. 7.

## NATAL TEA GARDENS.

We recently had occasion to mention the interesting fact that coffee planting was a growing industry in the Shire Highlands of South-East Central Africa. In this marvellous continent the cultivation of tea has not been neglected, and a certain measure of success has attended tea planters in Natal, which might easily have been greater had the Government extended its assistance to them, had they not been quite so jealous of each other, and had they named their teas properly and sent only the superior sorts to market. Despite these drawbacks they have managed to do fairly well, although those who are acquainted with the size of Indian and Ceylon gardens will, doubtless, smile when they learn that there are barely 3,000 acres of land under tea cultivation in the entire colony, and that the number of tea gardens is five. It is only since 1891 that tea cultivation in this part of the world has made any perceptible progress, although a commencement was made so far back as 1882. The tea district lies within six miles of a place called Stanger, amid beautiful scenery and a fine view of the sea can be obtained from many points in the plantation. As regards the total output of tea from the colony for the present season, the Tropical Agriculturists states that the result will be below that of last year. In December, 1895, the colony experienced sad disaster in the burning of the large central factory at Kearsney, by which one hundered thousand pounds of tea was destroyed at the same time. It cannot after this loss be responsible for more than 300,000lbs. for the season of 1895-96, and so the total crop of Natal tea this season will not be more than 700,000lbs., but next year they hope to reach so high as one million pounds weight. The greater portion of this tea is consumed in Natal itself. Fields, further ahead, to the South and inland, are yet practically untouched; but those who would secure them must do so at once, as the industry with all its drawbacks is rapidly spreading. It must, however, be some consolation to Indian and Ceylon growers to learn that their own trade does not appear likely to suffer from this competition, for Johannesberg does not take to Natal tea, and it is mentioned that Indian and Ceylon teas are getting very firmly established in all parts of South Africa. Like other planters, those of Natal are troubled concerning their coolies. Their discomfiture does not appear due to the causes that vex and irritate planters in this part of the world, but to the cost of cooly labour which is far too expensive, and no wonder if the coolies are imported from India. It is very interesting to hear of this budding industry, but it is somewhat doubtful whether it will ever attain sufficient proportions to be included as an important factor in the tea trade of the world.—*Madras Times*, Sept. 5.

## INDIAN PATENTS.

Specifications of the undermentioned inventions have been filed under the provisions of Act V of 1888:—Machine for Plucking or Cutting the Leaves of the Tea Bushes.—No. 349 of 1895.—Henry Fischer, manager of the Central Duars Tea Co., Ld., in the Alipur Duar sub-division of Jalpaiguri, Bengal, for a machine for plucking or cutting the leaves of the tea bushes and for collecting the same. (Specification filed 9th June 1896.)

## THE KLANG PLANTING AND ESTATE SYNDICATE (LIMITED)

has been registered, by Timbrell and Deighton, with a capital of £6,000 in £1 shares. The object is to enter into an agreement with J. R. Rodgers, and to carry on business as tea, coffee, cocoa, tapioca, and pepper planters and growers in the Straits Settlements or elsewhere. The directors are to be elected by the signatories. Qualification, £100. Remuneration to be fixed by the company. Registered office: 25, Bochurch-lane, E.C.—*L. & C. Express*, Aug. 14.

Ceylon Sets an Example to South Indian Planters.—The *Madras Times*, after quoting remarks made by Mr. Rogivue's recently published letter regarding Ceylon tea in Russia adds:—Remarks of this kind should be of interest to South Indian planters, who are understood to have recognised the necessity of developing all available markets for their Tea and Coffee. It is to be hoped that, like their Ceylon brethren, they will provide funds sufficient to back up enterprise, and will thus find a way to improve the already large demand for their products. The example that Ceylon Tea has set in Russia and in America is a capital one, and the progress of Ceylon tea there should be closely observed by South Indian planters.

## PLANTING AND PRODUCE.

TEA AND THE REVENUE.—In their annual report for the year ending March 31, 1896, the Customs Commissioners take the opportunity of endeavouring to cool the ardour of those who advocate a free breakfast-table. The consumption of tea has developed still further, there being an increase of 4·4 per cent. "over the produce of this source of revenue in 1894-5," but the excess in the consumption reaches the handsome total of 9,192,066 lb. This advance, it is pointed out, is "very remarkable in the absence of any reduction in the rate of duty, especially when it is noted that in 1890-1, following the reduction of the rate from 6d to 4d per lb. the adjusted the figures, showing the estimated true increase of consumption, recorded an advance of only 11,053,000 lb. in the quantity used." The Commissioners suggest apparently that it is not worth while to reduce the duty any further when the nation goes on drinking tea at such a gratifying rate.

THE SAME STORY.—Consular reports from China have but one tale to tell about tea. The British Consul at Amoy says: "The tea season of 1895-6 has, owing to the unfortunate war, with Japan, been fraught with many vicissitudes, and must, on the whole, be regarded as an extremely unsatisfactory one to all engaged in it, foreigners and natives alike. The season in Tamsui opened in April —an unusually early commencement, due to the island being threatened with an attack by the Japanese. All concerned in the trade were anxious to get their teas away for fear that war and its attendant troubles might possibly prevent shipment. This naturally tended to high prices and hasty preparation. In the meantime the consuming markets failed to respond in any way to the high prices paid in the East for early teas, but rather, on the other hand, have fallen below their previous level, and were dull and dragging for the Formosan staple throughout the year, and the losses on shipments are supposed to be not inconsiderable. Chinese holders in Amoy were not willing to face the losses entailed upon them, and at the close of the year were left with a stock of 166,000 half-chests on their hands, a state of affairs unprecedented in the history of our trade. Now that Formosa is ceded to Japan, the future of the Amoy-Tamsui trade is a source of considerable anxiety to those engaged in it, and divergent opinions exist as to whether the first-mentioned port can still remain (as it has done for the last 25 years) the practical headquarters of the Formosa tea business. The Amoy tea districts, which likin and excessive export duty have thrown out of cultivation, and have almost depopulated, are amongst the finest in the world, and with the enlightened methods of cultivation adopted in India, Ceylon, and Japan, and such limited taxation as exists in these countries, need fear no rival. Now that, at our very doors almost, Japan is about to conduct tea cultivation on enlightened lines, surely the time is ripe for China to follow suit, abolish likin and export duty, and admit machinery. Twenty-five years ago 3,000,000 dols was the annual income of the Amoy tea districts; today it is not 350,000 dols. Likin has done it. The quantity of Amoy and Formosa tea for the year 1895 was :—Amoy teas 2,124,400 lb.; Formosa teas, 16,170,667; total, 18,295,067 lb."

COCOA AND COFFEE.—Cocoa and chocolate continue to be in increased popular favour. Ten years ago they brought in £73,593 to the Exchequer. In 1885-96 their yield was £124,745, an increase of 76·9 per cent while the estimated growth of the population during the same years has been about 8·6 per cent. Coffee has been less in favour than it was last year, and very much less than it was in the earlier years of the century. Its gross yield in 1895-96 was £170,959, or £2,301 less than in the previous year. In 1840 it yielded £921,000, so that the change in the popular taste has been very marked indeed.

NATAL PLANTERS AND THE LABOUR QUESTION.—Planters everywhere have their little troubles, and those in Natal are not exempt. A telegram from Cape Town says that "The Natal artisans are agitating against the continuance of protection for tea and sugar because the sugar planters have tried to introduce Indian artisans." We presume the term artisan is a courtesy title for coolie labourers.

THE INCREASE IN THE CONSUMPTION OF TOBACCO.—The use of tobacco is shown to have been gaining ground. That the receipts from the duty on tobacco rose in 1894-95 by £296,810 above those for 1893 94 admitted of being explained as due to the check caused by the great coal strike in the earlier year. But in the receipts for 1895-96 there is no such allowance to be made, and they increased by no less a sum than £336,730. amounting in all to £10,933,413. The total amount of tobacco in all its forms—raw, manufactured and cigars —on which duty was paid in 1895 96 was 67,551,95 lb, as against 65,528,385 lb. in 1894-95.—*H. and C. Mail*, Aug. 28

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## VARIOUS PLANTING NOTES.

TEA CULTIVATION IN SOUTH AFRICA.—From contemporaries we see that some interesting samples of tea from Natal have reached London—entered for competition at the Pietermaritzburg Agricultural Exhibition and sent to London for adjudication. They are superior in quality and value to those hitherto seen, and resemble Indian tea of good medium grade, without the same distinctive strength or flavour, and in some respects like high-grown Ceylon tea. They come from estates situated close to the sea-coast, their elevations ranging from 100 to 500 feet above sea level; the unusual rainfall being about 48 inches at the lower level and about 40 inches at the higher. The temperatures are stated to be as follows. In winter at sunrise 50° to 56°: at 11 a.m. 80° to 84°. In summer at sunrise 64° to 70°; at and 11 a.m. 92° to 96°. The estates are well wooded and watered. There is a ready sale for the produce locally, and as it is good and palatable, and has the benefit of the protective import duty levied on tea in South Africa, it may be assumed that this Native industry is a profitable one, though, in the absence of details respecting cost of cultivation and manufacture, this cannot be stated definitely. It is not considered proable that it can be exported with profit in view of the low price of tea in all the markets.

CAMPHOR CULTIVATION IN INDIA.—Attention was drawn the other day to the favourable prospects that seem to be before camphor cultivation in India, if it could be successfully started, owing to the increase in the value of the commodity and the exhaustion of the supply, which portends that the rise in price will continue. From an interesting extract which the *Pioneer* publishes out of an old Report of the Chinese Imperial Customs, it appears that so far back as 1869 the decline in the productiveness of the Formosa forests owing to the wasteful methods by which the camphor was obtained, had been attracting notice: and it is therefore pretty clear that the present high prices are not due to the disturbed state of the island, though this may have temporarily aggravated matters, but have a deeper foundation. In 1869 camphor was obtainable in Tamkui at 7-80 dollars per picul (133⅓ lb.); in the last Hongkong price currents it is quoted at 86 dollars. The destruction of the trees has now been going on for so many years that unless the Japanese come to the rescue very speedily, they will find before long that the camphor export trade which has been the great stand-by of their new possession is a thing of the past. Meanwhile, says our contemporary, this is clearly a case where the Indian Forest Department should see whether they cannot anticipate the future which seems likely to offer such a great opportunity. Experts are inclined to believe that in Sikkim especially the *cinnamomum camphora* would flourish magnificently.

## Correspondence.

*To the Editor.*

### CITRONELLA CULTIVATION IN THE SOUTHERN PROVINCE.

Dear Sir,—Your correspondent's note in regard to the above in a recent issue is misleading in that he quoted only a *portion* of Mr. Elliott's report —giving the extent in the Galle district at about 1,702 acres—and omitted the important fact that in the *Matara* district Mr. Elliott states the extent is no less than 17,352 acres, and that citronella boiling apparatus have increased in number from 290 in 1886 to 476 in 1896. The latter too are many of them of much better make and larger size than in 1886, I understand, and able therefore to turn out a much larger quantity.

It may interest your readers moreover to learn that the grass now so extensively cultivated is somewhat different from that originally used. The leaf is much narrower and the general appearance very like the mana grass found on patanas upcountry. It is said this variety is much more hardy and requires less care than the old-fashioned citronella grass. The latter is still cultivated by Messrs. Winter & Son at Baddegama, and is said to yield a superior oil and one which commands a higher price.

The cultivation as carried out by natives entails very little outlay, unless there is competition for the land, which is frequently the case, but R52 an acre is freely given if necessary. The cost of manufacture is also small; the used grass being dried and utilised as fuel and the ashes applied again to the soil. Very large sums of money have been realized during the recent boom in prices by producers, and though the price has since fallen, the production has by no means ceased, nor will it prove unremunerative as long as it brings 50 cents a bottle.—Yours faithfully, S. MELLS.

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### THE LIMITS OF SMALL BREAKS OF CEYLON TEA.

Kandy, 21st Aug. 1896

Sir,—At the request of the Committtee I enclose for publication copy of correspondence between the Ceylon Association in London and the Tea Brokers' Association of London on the subject of the increase of the limits of "small breaks" of Ceylon tea at public sale in London. —I am, sir, yours faithfully, A. PHILIP,

Secretary to the Planters' Association of Ceylon.

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(*Copy.*)

Mincing Lane, London, E.C., 3rd July 1896.

A. Philip, Esq., Secretary, Planters' Association. Kandy, Ceylon.

Dear Sir,—I have the pleasure to enclose copy of correspondence with the Tea Brokers' Association of London on the subject of the increase of the limits of "small breaks" of Ceylon tea at public sale in London.

As the proposed increase may take effect from 1st October next, the correspondence should be published without delay for the information of Ceylon shippers.—I am, &c.,

(Signed) Wm. Martin Leake.

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(*Copy.*)

The Tea Brokers' Association of London, Dunoter House, Mincing Lane, E.C., 26th June, 1896.

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W. Martin Leake, Esq., Secretary, the Ceylon Association in London.

Dear Sir,—I am instructed by my Committee to forward to you the enclosed copy of letter addressed to it by buyers of Ceylon Tea, and to inform you that at a meeting held today it was unanimously resolved to recommend the increase of the size of "small breaks" to *18 chests, 24 half-chests* and *40 boxes* to take effect from 1st October next.

My Committee considers that the large increase in the import of Ceylon tea fully justifies the proposed alteration which, in all probability, would be attended by the attainment of better prices in consequence of a longer time being available for valuation.

I am also to ask the special attention of your Association to the paragraph relating to the sale of duplicate invoices on the same day which, in the opinion of the Committee, it is very desirable to avoid.—I am, &c., (Signed) W. C. Price, Secretary.

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(*Copy.*)

Ceylon Association in London,
4, Mincing Lane, 2nd July 1896.

W. G. Price, Esq., Secretary, Tea Brokers' Association of London.

Dear Sir,—I have laid your letter of 26th ult. before my Committeee. The recommendation for the increase of the limits of "small breaks" of Ceylon teas to 18 chests, 24 half chests and 40 boxes is approved provided that satisfactory arrangements can be made for the "small break" sales at some time other than immediately after the "large break" sales.—I am, &c.,

(Signed) Wm. Martin Leake, Secretary.

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(*Copy referred to.*)

12th June 1896.

To the Tea Brokers' Association.

Gentlemen,—We the undersigned, buyers on the Ceylon tea market, beg to call the attention of your Committee to the urgent necessity of taking steps to increase the size of the small breaks for public sale to at least the same limit as now prevails in Indian tea on the following grounds.

1. The increasing difficulty, if not impossibility, of accurately valuing so many samples for one day's sale.
2. The saving of time to be effected in the auction room, which would be invaluable to all concerned, and would admit of buyers being able to have their purchases sampled and sent out on the same evening.
3. The extra expense and labour involved in sampling so many small lots after purchase, and in furnishing samples of them all to our agents.

We desire also to take this opportunity of expressing our opinion that the number of grades into which Ceylon tea is sorted might advantageously be curtailed, more especially as regards the produce of the smaller gardens. We also think that the smaller gardens might be advised not to despatch their produce more frequently than once a fortnight, instead of weekly, and we also deprecate the practice adopted by some, even of the larger gardens, of offering duplicate invoices on the same day.

(Signed by) Peak Bros. & Winch, Ltd., Appleton Machin & Co., Joseph Tetley & Co., I. J. Batten & Co., and 38 other firms.

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### RAPE SEED.

Sept. 4.

Dear Sir,—Can you or any of your correspondents give me any information about rape seed and the production of rape-seed cake for manuring purposes? Would rape flourish at a high elevation, how long does it take to crop, and where can the seed be procured from?—Yours faithfully, PACHCHEI.

## CEYLON TEA IN RUSSIA.

PROGRESS REPORT BY MR. ROGIVUE.

From Mr. Philip, Secretary to the "Thirty Committee," we have received the following copy of a letter from Mr. M. Rogivue reporting further with reference to his work in pushing the sale of and advertising Ceylon tea in Russia :—

(Copy)

Maroseika House, Lebedieff.
Moscow, 18/30th July 1896.

A. Philip, Esq., Secretary to the "Thirty Committee," Kandy, Ceylon.

Dear Sir,—I beg to confirm my last respects of the 6/18th June. Everything is now in order at the Nijni Novgorod Exhibition, and I think that no one can visit that place without seeing something about Ceylon tea, and all who have been there to whom I have spoken tell me that it is so. The double pavilion, which everyone who enters the Exhibition must pass, is very handsome, and, being quite a different style from any other building in the place, is bound to catch the eye. In the grounds of the hotel, to which our pavilion forms the principal entrance, is a large museum, immediately behind our place, where a mechanical organ plays most of the day to attract people's attention, and when the passers-by look round, as almost without exception they do, they see our pavilion and archway with "Ceylon Tea" in huge letters on it ; and it is quite remarkable to see how many stop to have a good look at the place and read our signboards, etc. I have already had many inquiries from dealers in the country who have visited the Exhibition and tasted our Ceylon tea there, but, until the annual fair, which opened on the 15/27th inst. is more frequented, there will not be many merchants about the place. Every day, however, numbers of the general public come to try the tea ; and the man, the young lady and the boy whom I have in charge of the place are all smart enough and able to talk with would-be customers very persuasively. The man who had formerly been in a tea business, speaks well Russian, German, and French. I had him for some time, before going to Nijni, in my place here, tasting with me, learning the chief features about Ceylon tea, so that he is well qualified to look after the place when I am not there. At first owing to slovenly work in the painting and finishing of the pavilions, I had a great deal of unpleasantness with the contractor, but by sticking to it and constantly standing over the workmen I got all I wanted done and well done. I am having photos taken and will as soon as possible send you copies, but I wish some Ceylon people would visit the Exhibition and see for themselves.

In addition to the advertisement already mentioned in a previous letter, on both sides of an electric car inside the Exhibition, I was able to secure at exceptionally low terms, besides placards and transparents inside all the cars, the whole side on two other cars where the words: "Drink pure Ceylon tea ; economical ; the best tea in the world," etc., in large white letters on a red ground are to be read. As these trains run continuously the whole day round and round the grounds along the principal pathways and past the chief entrances of all the different sections, people must continually see "Ceylon Tea" and these words in its praise before them.

I have had a large number of new "brochures" specially printed (exemplary enclosed) to be freely distributed by hand among those entering the Exhibition, also at the Fair and in the Pavilions.

One big poster, 7 ft. by 7 ft. bearing the word—"Tea from the Island of Ceylon. Apply to M. Rogivue, representative for Russia of the Ceylon Planters' Association, Moscow, Maroseika House, Lebedieff. Tasting and free distribution at the Nijni-Novgorod Pavilion close to the Exhibition"—I have had made on metal and placed in a splendid position in the town near the approach to the bridge on the river Ora connecting the town and Fair and where all going from one place to the other must pass.

As I told you before, I have placards in the windows on the walls of several of the chief hotels and restaurants and have arranged with some of them for the supply of Ceylon tea. In the Nijni newspapers I am having frequent advertisements inserted during these three months of the Exhibition and Fair. Thus all the plans I made for advertising Ceylon tea at Nijni this year are now in working order and as good in every way as I could, with time and personal attention, make them ; but owing to the exorbitant prices for material and labour ruling there this year, which were quite unprecedented in the place, I have had to spend a great deal more than the sum granted to me by the "Thirty Committee" for the purpose. I think, however, the result should justify it, as far as the increased knowledge of and demand for Ceylon tea goes. To continue advertising and pushing pure Ceylon tea in the way I have been doing, I shall require more assistance, —not only pecuniary but also working assistance. I have read in my Ceylon paper lately several suggestions that more money should be spent in Russia, and somebody in addition to myself, be appointed to do the work. Whether the "Thirty Committee" hold this opinion or not I cannot say, but it struck me that if a man with the necessary qualifications could be found and your Committee wished to spend more money on the work, something might be done by his travelling and working in co-operation with me. If a Ceylon man so much the better, but without some knowledge of Russian and the ways of the country it would be a pure waste of money, speaking from my own hard experiences during the past six years.

Since Mr. Dowling joined me, it is true, I have been much freer to get about, but someone to visit the more distant places would certainly be an advantage.

If your Committee wish to adopt more expensive measures for pushing Ceylon Tea here I am prepared to lay my plans before you on more extensive but similar lines to those I have hitherto found successful and would include one or more special travellers.

I think you cannot deny that for the money expended through me you have got good measure, for not only has every penny been spent actually in advertisements, without any personal or management expenses, (beyond certain travelling charges specially incurred), but I have also added a considerable money of my own and I do not think anyone can say that the result has not been satisfactory as far as the demand for and import of Ceylon Tea into Russia in any criterion. I do not think anyone has better facilities or more qualifications for doing the work you require than I have now for the best advantage of Ceylon whose interest I have never placed second to my own since I was requested by the Ceylon Planters' Association to do what I could in Russia for them, with the result that a great part of the business accruing through my advertisements goes to other firms dealing in Ceylon tea, as it is *that* and not M. R.'s tea, I always make the object of my advertisements, as you know, a result, perhaps, not bad for Ceylon, but which retards what I looked to as the reward of my hard work ; *i.e.* the establishment of a well-known and successful business in Ceylon tea which would also be one of the most convincing advertisementss for your produce in this country. It has been evident to me all along that the only way to introduce Ceylon tea here was to create the demand among the general public by giving them the opportunity of trying it for themselves and procuring a supply, as the established tea firms would have nothing to do with Ceylon tea and I did not wish to, but have on the contrary greatly opposed it. My plans have, however, been so far successful that many of the former detractors of Ceylon tea have been obliged to deal in with the result the figures of which you already know. I hear from all sides here that the demand for Ceylon tea, and import of it into Russia has greatly increased this year, but unfortunately it is impossible to get any figures from the Customs, all tea being classed together, whether it be China or Ceylon, or other sorts, under the general heading of "Tea." Speaking the other day with the agent of the English Lloyd, who is also the British Consul here, he told

me that he was much astonished to note the large proportion of Ceylon tea imported this year by Russian firms in Moscow who insure through him.—I remain, etc., (Signed) M. Rogivue.

## SIR H. JOHNSTON ON CENTRAL AFRICA.

The Report by Commissioner Sir H. Johnston on the trade and general condition of the British Central Africa Protectorate, for the year ending March 31st, has been issued as a Parliamentary paper. The writer estimates the population of the Protectorate at 844,955, composed of 259 British subjects, 30 non-British Europeans, 263 Indians, 23 half castes, and 844,420 natives. The latter represents a considerable increase over former years and the Commissioner divides them among six tribes. He reports that satisfactory results have been met with in employing natives of India, as men better able to stand the climate, in minor capacities where in previous years it would have been necessary to use more highly paid Europeans; and he wishes that Indian traders who are not satisfied with their condition in the Transvaal and Natal would give British Central Africa a trial. The year 1895-6 had been exceptionally bad for health among Europeans and Indians, owing to an epidemic of malarial fever which had ranged as far as the Zambesi valley. Black-water fever was responsible for many deaths, and no other disease was so serious in its effects on the European settlers. But Sir H. Jonston thinks that when a railway is constructed from Quilimane to Blantyre they will hear very little more of the unhealthiness of British Central Africa. On this general subject he observes :—

"Undoubtedly another cause of ill-health here is the increasing consumption of alcohol, which is too obviously prevailing amongst many of the more recently arrived Europeans. The chief bane of British Central Africa is that accursed spirit whiskey. Good wholesome wine and light lager beer do no one any harm, and taken in moderation probably do good; but whiskey is always noxious, and in this climate consumed daily in considerable quantities, even though much diluted with water, is singulary prejudical to health. I concentrate all my abuse on this one form of spiritous liquor because scarcely any other is drunk except in small medicinal doses. Brandy is imported, for use as medicine, but rum, gin, and other spirits are scarcely used at all. It is whiskey which is at the bottom of much of our ill-health; it is whiskey which is answerable for many of our deaths. I do not mean to say that a man who eschews the daily use of whiskey or any other spirit thereby enjoys immunity from malarial fever; such is not the case, as I can unfortunately assert in my own experience; but what I would like to impress on those who are studying African questions is this—that the man who does eschew the drinking of spirits in Africa is generally much better able to resist the effects of malarial poisoning, and recovers very markedly and rapidly from often severe attacks of malarial fever, whereas the individual whose system is permeated with alcohol has hardly a chance when attacked by severe fever. Paternal legislation is generally of little use, but if there is one point more than another on which I should like to act tyrannically, on behalf of the general welfare, it would be the total exclusion from tropical Africa of any form of spirit, but a little good brandy, which should only be imported by qualified medical men for the use of their patients. I certainly would not exclude wine or beer, though I think stout and the heavier English beers are unwholesome. The moderate use of good wine of all kinds and of lager beer is distinctly beneficial to health."

Upon the subject of trade, the Report speaks most favourably :—

"Trade in British Central Africa has markedly improved during 1895 and the first quarter of 1896. The total trade of the Protectorate during the year 1895-96, in imports, amounted to 82,760*l* in value, The imports during the preceding year (1894-95) amounted to a total of 73,667*l*., independently of the goods imported by the administration (which were about the same value as those brought into the country in the year now passed). There has thus been a slight apparent decrease in imports, though, as before explained, this is actually converted into an increase, if the approximate sum of 10,000*l*. in specie be added. The diminution of imports has been under the following heads:—Alcohol, hardware, soft goods, and machinery. The total value of the exports from the British Central Africa Protectorate during the year ended March 31, 1895, amounted to 9703*l*. Consequently, there has been an increase in exports during the year just ended of about 9965*l*. The chief increase in exports has taken place in ivory, of which nearly 9000*l*. worth more was exported in 1895-96 than in 1894-95. In coffee, the increase in export has been about 3200*l*. in value. The export of rubber, oil seeds, beans, and wax has markedly increased during the year just ended; while on the other hand, the output of strophantus drug has greatly diminished. Coffee planting is likely to be our main staple of trade. Satisfactory expriments have been made in the cultivation of cotton on some of Mr. Sharrer's estates. Mr. W. Thiselton Dyer, of Kew, reports that cotton equal in quality to the sample sent would be worth in the English market about 4½d. per lb., or 39*l*. to 40*l* a ton. Tobacco is being grown with increasing success by the firm of Buchanan Brothers. Tea is being introduced by some Ceylon planters into the Mlanje district. It is already grown to a small extent by Buchanan Brothers. Quite recently an English firm have given their attention to the valuable fibres produced in British Central Africa by three species of liliaceous plants of the genus *Sanseviera*, viz.:—*S. sulcata*, *S. cylindrica*, and *S. guineensis*. The *Sanseviera* grows in great quantities on all the barren, stony ground of the Protectorate, at low levels, especially on the rocky islands in Lake Nyasa. A machine has been invented which is able to turn out enormous quantities of fibre from this plant in a very short space of time, and it would seem as if the barren ground of the Protectorate would prove to be of almost equal value to the rich coffee producing tracts, since this fibre is worth nearly 40*l*. per ton. Moreover, the *Sanseviera* is of most easy propogation, requires little or no attention, and in three years from the time of planting is ready to reduce to fibre. It is a curious-looking plant, with long, narrow, thick, and fleshy leaves, which latter can be cut in pieces and easily rooted. Besides the *Sanseviera* there are numerous trees and plants which produce fibre of more or less value. Another product which I hope will be greatly developed in the future is india-rubber, which is produced from three species of *Landolphia*, one or more species of *Ficus*, and by a shrub recently discovered and named *Tabernæmontana elegans*. Limestone of excellent quality has been found in many parts of the Protectorate where it was not previously known to exist, and the Administration has under-

taken a good deal of lime-burning for its own building operations and also for sale. The native now turns out excellent bricks, which he sells with advantage to the European for building purposes. Important discoveries of guano have been made on the island and islets belonging to Great Britain on Lake Nyasa."

The Commissioner considers that the general condition of the Protectorate is now markedly satisfactory. A sense of peace and security has settled on the natives which has never before been known. They are leaving the chilly hill-country and settling in the warm plains which they love, feeling that they have now nothing further to dread from the attacks of foreign slave-raiders, or from the more turbulent among themselves. This consummation is what the British authorities have all along striven to bring about, viz., the abandonment on the part of the natives of the crags and mountain fastnesses where they could barely grow enough food for their own subsistence, and their placing of the rich, hot, unhealthy plains under cultivation.

Three appendices to the Report are devoted to the subjects of big game, coffee planting, and missions. Upon the first subject the Commissioner says :—

"The best time for sport in British Central Africa is between the months of June and December, and all sportsmen would do well to try the Elephant Marsh, near Chiromo, before they venture farther inland, as it is possible they might make sufficient bags of game in this portion of the Ruo district without going to the further expense and risk of penetrating far into the interior of Africa. Chiromo can be reached direct by river steamer from Chinde in a few days, and is therefore, within little more than a month off England. No difficulties are at present placed in the way of big game shooting, except as regards elephants, rhinoceroses, and the almost extinct giraffe, which are, to a certain extent, protected by a licence having to be taken out for killing them. This licence lasts one year, and costs 25*l*."

The appendix devoted to Missions gives the history of the Universities Mission, and the later settlements of other Societies, and concludes as follows :—

"No person who desires to make a truthful statement can deny the great good effected by missionary enterprise in Central Africa. There are some missions and some missionaries out here of whose work nothing but praise can be uttered, though much just criticism might be written on their mode of life, which, in some instances, is singularly and needlessly ascetic and uncomfortable. Asceticism is all very well in a wholesome part of England, or in an equally healthy North African desert; but any attempts to live carelessly, uncomfortably, and too frugally in the exceedingly unhealthy climate of central Africa must sooner or later result in the permanent disablement of the missionary's health or his death, and can serve no useful or Godly purpose whatsoever. The missionaries at one station at least eat bad food badly cooked and the rude houses in which they live are, with the exception of the quarters assigned to the ladies, unfit even for a native's occupation. It is pathetic to see highly educated men from Oxford and Cambridge hollow-eyed and fever-smitten, crouching in little huts which no native chief would deign to occupy. They are guided in so doing by a false principle that the funds of the Mission, which are not large, should be devoted entirely to mission work, and that little or no money should be spent on 'comfort.' I wholly disagree with them. I think that if Europeans are expected to live in Central Africa, and to carry on an active work, whether it be educational, religious, commercial, or political, they should first of all be comfortably housed, and, secondly, they should eat the best of food, cooked by the best of cooks. If they will do this then they may just hope to be able to spend ten or fifteen years of their life in Central Africa without serious deterioration of their health. The next criticism which I might offer on missionary life and conduct almost ceases to have any actuality; it would be to remark that in many cases they have been too apt to throw themselves into politics, native and external, and to wield the great influence they possess over the natives so as to constitute themselves a power in the land, with a self-assumed right to interfere in all questions of administration. This phase is, however, rapidly passing away, and was a not unnatural result of the entire want of Government which subsisted in British Central Africa until its constitution as a British Protectorate. About mission work in other parts of the world I have no direct knowledge, but I can say of all mission work in British Central Africa that it has only to tell the plain truth and nothing but the truth to secure sympathy and support.—*Standard*, Aug. 29.

## JADOO FIBRE.

An esteemed correspondent in England has drawn our attention to a new substance of extraordinary value in which plants can be grown. It is called Jadoo fibre—jadoo being presumably the Persian word for magic—and is a patent by Colonel Halford Thompson, R.A., of Teignmouth, South Devon. The foundation of the fibre is peat moss; which is exceedingly spongy and capable of absorbing into its composition any chemicals with which one may wish to impregnate it. This peat moss is boiled with those chemicals which are required for plant food, and to ensure their thorough amalgamation and decomposition the fibre is fermented in a particular way after the boiling process is completed. When the substance is ready for use, it is practically free from any smell, and being also quite clean, it has been found of great advantage in England for such pots as are wanted to be placed in-doors. In India, where ferns and plants are frequently employed in the decoration of dwelling-rooms, the fibre should be found of equal advantage. Our correspondent writes :—"I have been over Colonel Thompson's place at Teignmouth and have seen what astonishing results he has obtained with this most wonderful material, not only with flowers but with sugarcane, beetroot, cucumbers and positively also with coffee and tea in his own greenhouses, I cannot help thinking that for coffee and tea nurseries it would be a tremendous success. Colonel Thompson has letters from the West Indies and South America which show that in purely 'planting' products the fibre is likely to give most surprising results. It is no quack manure but a substantial growing medium. I have seen apple-trees grown *in small pots* filled with it, and they are simply weighed down with the fruit, some of the apples being monsters. It looks quite uncanny to see them on the tiny trees. Amongst other wonders Colonel Thompson shows a magnificent crop of clover grown in sterile soil from the Landes District of Bordeaux which has been watered with liquid jadoo," In confirmation of our correspondent's remarks comes a report from the Agri-Horticultural Society of India on jadoo fibre as a propagating medium, the results in its Gardens in Calcutta having been most satisfactory; some plants which had hitherto defied all methods of propagation, except on a hotbed under glass,

having struck in this substance, and all plants on which experiments were tried having propagated much more readily in the fibre than in earth. Jadoo liquid is a fertiliser pure and simple, and apparently of high manurial value, but on its particular merits we cannot speak more definitely here. Apropos of our correspondent's remarks of the advantage of the fibre for tea and coffee nurseries, it seems to us that this fibre promises to provide a certain method for bringing on "supplies." Were our belief to prove true, planters would have good cause to bless the magic of Colonel Halford Thompson. This gentleman, whose address we have given, is only too glad to supply all information to anyone who applies to him, and some of our planting readers may think it worth their while to ask friends in England to communicate with him or to pay him a visit. Arrangements, we understand, are being made for a local Agency, and a small consignment of the fibre for experimental purposes is already on its way out.—*M. Mail*, Sept. 9.

## RUSSIAN TOBACCO.

The tobacco crop in European Russia and the Caucasus for 1895, according to the *Journal de St. Petersburg*, was inferior to the preceding year's. Although the extent of ground cultivated (about 52,000 hectares) remains about the same. The most extensive plantations are found in the central and south-western provinces, but these are only for the production of the commonest tobacco consumed by the peasants. In the provinces of the south, on the other hand, only the kind known as Turkish tobacco is cultivated. In the Crimea, Bessarabia, and the Caucasus these tobaccos are excellent, and used in the manufacture of cigarettes, either pure or mixed with Macedonian tobacco. The total crop of 1895 amounted to 64,183,000 kilogs, as compared with 67,654,000 kilogs, in 1894 and 81,207,000 kilogs, in 1893. Three-fourths of the total is of the common kind. Odessa is still the great centre of the tobacco import trade, though for some years past the manufacturers of St. Petersburg and other towns of the north import their material direct from abroad. The quantity imported at Odessa diminishes every year, but it 1895 it still amounted to 321,500 kilogs.

## THE AGRICULTURAL RETURNS.

The Board of Agriculture have issued their customary preliminary statement of the agricultural returns of Great Britain for 1896, compiled from the returns collected on June 4. The area under wheat was 1,693,957 acres, an increase of 19.5 per cent. upon 1895, but 12.1 per cent. below the acreage of 1894. Barley, 2,104,764 acres, a decrease of 2.8 per cent. upon last year, and a very small increase over 1894. Oats, 3,095,488 acres—decreases of 6.1 and 4.9 per cent. respectively upon the two preceding years. Potatoes, 563,741 acres, increases of 4.2 and 11.8 per cent. upon the two previous years. Clover and rotation grasses, 2,171,966 acres; and permanent pasture 4,638,722 acres, the former being a decrease of 5.7, and the latter of 2.6 upon 1895. The acreage under hops was 54,249, a decrease of about 8 per cent. of the previous two years.

The number of cows and heifers in milk or in calf is returned at 2,511,675 which is an increase upon last year of 1 per cent., and upon 1894 of 2.1 per cent. Other cattle number 3,981,907, which are a decrease of 4.6 and 10 per cent. respectively in animals of two years and upwards, and increase upon last year of 9.7 per cent. in cattle between one and two years old, and of 5.1 per cent. in those under one year. The total number of cattle is 6,493,582. Ewes kept for breeding number 9,925,587, and other sheep 16,779,742. All these items show a progressive increase for two years, the total number of sheep, 26,705,329, being 3·5 per cent. above 1895, and 3.3 above 1894. The total of pigs is 2,878,801, which is a small number below 1895, and an increase of 20.5 upon 1894.—*Standard*, Aug. 29.

## INDIAN PATENT.

Applications in respect of the undermentioned inventions have been filled, during the week ending 29th August 1896 under the provisions of Act V of 1888.

IMPROVEMENT IN TEA LEAF ROLLING MACHINES.—No. 172 of 1896.—Samuel Cleland Davidson, merchant, of Sirocco Engineering Work, Belfats, Ireland, for improvements in tea leaf rolling machine. (Specification field 20th August 1896.)—*Indian and Eastern Engineer*, Sept. 12.

## RUSSIAN TEA PLANTATIONS IN THE CAUCASUS.

The entry of Russia into the ranks of the tea-growing countries of the Old World is a fact which has scarcely attracted here the attention it certainly merits. The Russian plantation have years ago passed the experimental stage in the Caucasian highlands where they are located, and are being rapidly extended. One firm alone, whose gardens are situated not far from Batum, employes over 600 hands, under the supervision of Chinese foremen, in the culture and preparation of the leaf, and the Government is about to engage in the industry, the Department of Crown Estates having acquired last year over 43,000 acres of land in tho district of Chakva for the cultivation of the tea-shrub, And in order that this object shall be attained with tho greater certainty of success, a special Commission, consisting of the Inspector of the Imperial Domains and two subordinates, spent a portion of last year in the tea regions of India China, and Ceylon nothing the mode of prepartion for market in each place and the latest processes employed there, as well as obtaining native experts to undertake the management of the extensive gardens which are to be planted in the Caucasus. The Caucasian home-grown tea is already on the market at Moscow, and finds favour with tho Muscovite consumers, who have never shown a disposition to take to the imported leaf from British India and Ceylon. The Russian palate finds the Assam and Colombo growth too harsh and rough, and prefers the softer and smoother product of China. The Caucasian tea is pronounced by good judges to be equal in every respect to the average Chinese article which reaches Russia overland, *via* Kiakhta and Maimachin. Some assert that the Russian, or rather Caucasian, tea is superior in flavour to that imported. Be that as it may, the fact remains that the shrub succeeds well in the mountain-lieutenancy of the South, and the increase in the plantations and product there is now such as to lead Russian publicists, like M. Batalin, to look forward in a few years to the exclusion of Chinese tea altogether from Russian markets, in favour of the home grown article, by which means the State will savo for circulation in the country over 42,000,000 roubles, which amount at the present time represents the yearly tea bill paid to the Celestial growers, dealers, and carriers. The anticipation is far from being so extravagant as at first sight might appear. Not so many years ago when wine-making was started in the Crimea, the idea of competing with tho French, Spanish, and Italian wines imported into Russia was derided, not alone by foreigners, but by intelligent and liberal-minded Russians themselves. Now the Crimean product is supreme in the market, and the foreign vintages are being every day more and more expelled from the daily consumption of the middle-class Russ,

It is a singular fact, perhaps, and one worth nothing, that it is to Englishmen that the introduction of tea culture to the Caucasus is really due, for it was an Englishman who was the first to point out to Russians that the soil and climate and general conditions of growth in the locality near Batum exactly resembled those of the regions of China where the finer qualities of tea are produced. The early experiments of cultivators, prominent among whom was Professor Butlerov, were dead failures 30 years ago. And Butlerov's successors did not succeed where he had failed. The first success at tea growing in the Caucasus attended the efforts of Colonel Solovtsov, who commenced cultivation on an insignificant scale about 10 years ago—to be precise in the year 1885. He had, as may be anticipated in Russia, many difficulties to contend with ere he could start his experimental garden. Neither seed nor plants could be obtained in Europe, so he had to import young shrubs from China. Seed was not to be relied upon, for the Celestials generally send the outer barbarians old seed which will not germinate, and new seed when it is obtained loses a certain essential oil it contains in the course of a long tropical voyage, and consequently fails to grow when sown. In the month of July, 1885, Colonel Solovtsov succeeded in obtaining from China a few tinny plants, but these had been maltreated by the Customs authorities, who, not knowing one plant from another, took them to be vines, and accordingly disinfected them well with quicklime to prevent the importation of the phylloxera into the country. The young seedlings were at once taken to Solovtsov's garden at Chakva, near Batum, and planted out in a soil of a red clayey nature, which had been trenched two spits deep. At first all grew badly, and the larger shrubs died off, but a few of the smallest of the seedlings lived on, grew to a fair size and bore seed, and from these Colonel Solovtsov was enabled to increase and extend his plantations. The garden covered five years ago five acres of land, contained over 2,000 plants about five years old and 8,000 seedlings and over 42,000 more were to be raised by 1893. The variety grown by Colonel Solovtsov is that scientifically termed Thea Viridis, a more northerly species of the Thea Sinensis. While Colonel Solovtsov has been carrying on his experimental plantations in the Caucasus, other firms have embarked in the industry as a commercial speculation with a view to remunerative returns. Foremost among these is the house of K, and S. Popov, of Moscow, a firm engaged in the China tea trade as agents and importers. They have over 500 acres of tea plantations at Chakva, near Batum, on the shores of the Black Sea. They are managed by Chinese overseers and suprintendents who have been brought from China for the purpose, and they afford occupation to over 600 native labourers. Such has been the success attending these tea-gardens that, it is reported, large extensions of the plantations are contemplated now that the peculiarities of the tea shrub are better understood, and its requirements in the strange soil of the Caucasus have become more clearly kown. Some idea of the proportions which the tea industry in the Caucasus is beginning to assume may be gathered from the fact that a force of labourers 600 strong as employed on the Popov plantations is equal to the production of 10,000 lbs. of tea per week.

The plant appears to have no special care or treatment in the districts of the Caucasus where it has been acclimatised. Propagation by means of cuttings is best avoided, it is said, for the cuttings do not take in reasonable proportions, and plants raised from cuttings never make sturdy, bushy shrubs. Seedlings do best and require least attention. They are raised with certainty from the seed which, in the Caucasus, ripens in the course of a year, and are gathered in the month of October, at which time the Thea Viridis flowers. The seeds after being collected are mixed with dry sand, and kept in earthenware receptacles until the month of March, when they are damped with a solution of camphor spirits and water, which hastens and promotes germination. They are then replaced in the earthenware vessel, but mixed with a quantity of black soil in which they begin to grow, and as soon as the tiny seedling are large enough to handle, they are carefully lifted out, one by one, and planted in nursery rows. Here the soil is improved by an admixture of sea sand, and the plants are protected from the sun by mats stretched over them. In dry weather they require watering once a day, and under the system here outlined every seed without exception germinates, and every plant grows to a sturdy shrub, yielding a full supply of leaves for picking in the proper season, or as it is termed "flushing." When planted out in the permanent gardens at the end of the first year they require no attention whatever, either in shading or artificial watering, but may be safely left to nature, the only thing needful being to keep the ground clear of weeds, by hoeing well twice a year. During the dry season in the Caucasus, that is, the months of May and June, when the heat is intense, the plants do not seem to feel the effects of the drought in any way. And they stand the bitter cold of the exposed region of the Black Sea equally well. The winter of 1892-93 was an exceptionally severe one. The temperature was as low frequently as 6 deg. of Reaumur, 13·5 deg. below freezing point, and although the tea plants were covered with snow and ice up to the tips of the leaves for days together, neither the older shrubs nor the young seedlings suffered in any way. And the tea gardens in the Batum district are in a quite open and exposed situation, where every blast of cold wind sweeps the entire length and breadth of the country.

With a plant so accommodating in its nature, soil and climate adapted to it, and the plantations of one firm already equal to an output of 10,000 lb. weekly, the tea industry of the Caucasus must be pronounced to have made not merely a good start but very remarkable progress since 1885, when the first serious attempts at cultivation had their origin in Colonel Solovtsov's experimental garden. And, now that the Government is going in for the business on a large scale, the industry has every prospect of attaining big proportions. It may not realise all that patriotic Russians expect or assert, but it can hardly fail to deal a serious blow to the Chinese trade, and may indirectly, if not directly, have some effect upon our own plantations in Assam and Ceylon.—*Morning Post*, Aug. 22.

## NOTES FROM THE METROPOLIS.

BUXTON, Aug. 29.

I have alluded above to

MEXICO

and its capable President Dias; but I saw lately great complaints about increased export taxes which it is proposed to levy on produce leaving that country. This will no doubt check the extension of coffee planting, among other industries there.

Mr. Steveni writing from Sweden in answer to an inquiry, as to the prospects of

CEYLON TEA IN SCANDINAVIAN COUNTRIES,

has given me some interesting information. He writes:—

"You would like to know what prospects Ceylon tea has in Sweden and Norway. As the Swedish and Norwegian people are every year becoming more attached to tea-drinking I should say your tea has a great future here."

Mr. Steveni recommends an agency in the island of Gothland, where he was on a visit; and which he says has a population of about 60,000, mostly well-to-do farmers and peasants. I have endeavoured to interest a well-known Ceylon tea-distributing firm (its partner being old Ceylon planters) in this new opening and hope something will come of it.

Only the other day was my attention drawn to some ill-considered remarks in a contemporary of yours, criticising my letter on

COFFEE PRODUCTION

in the London *Times*, with the snarl that I should be doing the Ceylon planters bet-

ter service by leaving out all mention of their coffee experience, and also of the risk of over-production of tea, I fancy there is no sensible man in Ceylon who thinks so. For, surely any thing that may divert attention and capital from the cultivation in new countries of our present staple, tea, in favour of the old and under-produced staple, coffee, tends to be of service to Ceylon planters at the present time; while to correct a gross misunderstanding and afford correct information was ample justification for the latter. But—as an old pressman—I should really let such trifles pass without notice: to misconstrue is sometimes very natural.

I have a remarkable confirmation from "Cosmopolite" of

THE KEEPING QUALITIES OF CEYLON TEA.

He wrote to me lately as follows:—

"I enclose a cutting from your London letter and would remind you that about 12 years ago 'Cosmopolite' said the same as Mr. Donald Noble says now, and so positive am I in my belief that I keep one chest of tea *maturing* whilst I am drinking the other, in fact I have always a chest in hand ripening."

J.F.

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## AMONG THE COCONUTS, AND BEYOND.

(*From a Planting Correspondent.*)

Puttalam is quite out of the track of the pleasure-seeker or the globe-trotter either: but for all that it is not much of a place when you get there. No wonder the old Malay resthouse-keeper enquired, in a confidential way, why I had come; and when I told him just to have a look at the place, I could see that he did not believe a word of it. People no doubt sometimes go mad, but such an aggravated form of mental disease as enduring a night journey in the bullock coach, to revel at the grey dawn in the natural beauties of that salt-pan has never before been known, and you would have stamped yourself as an idot to have believed it. So, I guess, the old fellow argued, and doubtless credited me with some saner motive.

What a night of horrors that ride was from 6 p.m., to 5 a.m.—for it was impossible to sit or lie, and what with the jerks that almost dislocated your neck, and the bumps which your head got, life was not worth the living. Then there were the mysterious stoppages, with a clatter that went on for ten or twenty minutes over the delivery of a mail bag, and "such" a bag which had to be found, and by and by another bag was received, then a shout to the cattle, and a plunge into darkness. We crossed a ferry at midnight, and before doing so, waited heaven only knows how long. A fellow who spoke English assured me that there was no unusual delay. They had to allow "the more previous coach" to get on. He was quite willing to converse, but I was not—felt more inclined to swear. The cattle in the coach did well. They went off with a wild rush, then trotted, then into a walk, and so it was kept up, doing four miles an hour easily.

It was an added horror to find the resthouse shut up; but in a little the old boy in charge shuffled around, prepared an early meal, filled the bath, flapped about a handkerchief as a pretence for dusting, went off to the bazaar for the breakfast, and seemed to bring in his purchases in instalments—a tin of jam now, beef next time, fish after—thus making the most of it. He told me that his visitors usually travelled with their own servants and supplies, and all we had to do was to collect the rest-house charges, hence his chronic melancholy.

When the breakfast was being collected I took a look round the place, and was soon satisfied. The whole population seemed Moors. There was a mosque, of course, with the rigged-up mast fluttering with flap; a big Moorish school was in full swing, the scholars grinding at Arabic; the trees were stunted and all growing the one way, and there was a strong dry salt wind meeting you at every corner in quite a blustering way. The wind came off the Puttalam lake, and had an odour which wanted freshness, an ancient fish-like smell. I walked out to the "upu pallum"—the salt pans—a whitened desolation, and saw on my way back a half-dried tank. I was struck, however, by the healthy appearance of both man and beast, especially the pariah dogs, which were the biggest and best cared for I have ever seen. Usually the pariah is "high in bone and low in flesh," a brute of furtive look and habit, ever anticipating a stone or stick: and its readiness to howl if you but move your hand, sadly evidencing the hard struggle for existence which is the sum of his life. These dogs, however, were big and well nourished, were friendly and wanted to be patted, and were not the white-toothed snarling outcasts that usually are seen. In walking through the bazaar you were not always on the watch for an unexpected rush, for they allowed you to pass on your way unheeded, and seemed wholly to have forgotten the habits of the pariah. The town seemed very clean, and if there be a Local Board it has some credit for its work. But to get back to civilisation was what bothered. To go through another night journey was a horror to anticipate, and was happily avoided by a special having been put on, and our getting under weigh at 1 p.m. Eight hours at Puttalam seemed long enough, and by starting at midday we had a chance to see the road which we missed the previous night in the darkness. As we got along towards Chilaw, the small prickly scrub gave place for bigger jungle till by and bye we touched forest, and the flourishing plantations of young coconuts was evidence enough that we had passed into the region of direct rainfall. The weather, although cloudless, was very cool, and as the cart was a really comfortable one, we were prepared to enjoy the ever-changing scenery. Tracts of green, glimpses of water and clumps of forest, and the graceful coconut, all helped to charm; and when night fell the young moon shone out, it was even more beautiful than day, and more than a reward for the weariness of travel. At 11 p.m. when Chilaw was reached, the place was all astir with lights and bustle. It was some play the Catholics had got up, but ten hours in a cart, did not pridispose you for aught but bed. The Chilaw resthouse, is very comfortable, nicely situated and cool in the extreme. At the one side you look toward the sea, can watch the spray shoot up and hear the beat of the waves on the beach: at the other side, toward the town, there is a mixed mass of waving ponds, houses, a bit of road and the glitter of the back water here and there. If you want to be reminded of Ceylon life, you may be, but if your wish to be at rest then the sea view will give it and the ozone-laden air will add its virtues. I hear much of coconuts, and the value of them and very likely all is true; but meanwhile it has been a pleasure to have been among them, and with that I am content.

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Tea, Coffee, and Cinchona Cultivation in India.—From the Government of India we have received a bulky volume of "Agricultural Statistics of British India for the years 1894-95," consisting for the most part of elaborate tables, with an explanatory memorandum prefixed. Of special interest to us in Ceylon are the tables of tea, coffee, and cinchona cultivation in each district of each province and in the native states in 1893 and 1894, and the progress in each product from 1885 to 1894. In 1893 the total area under tea in India was 395,839¼ acres; and in 1894 it had increased to 422,551 acres. The highest average yield per acre from mature plants was obtained in Jalpaiguri, viz. 555·9 lb. in 1893, and 541·3 lb. in 1894. The total acreage under coffee in India in 1893 was 258,984·14 acres, and in 1894 it was 277,881·94 acres. In 1893-94 there were 11,235 acres under cinchona in India; but in 1894-95 the acreage had decreased to 8,710.

## HYBRID COFFEE.

We recently made some enquiries of a scientific friend regarding the interesting question of coffee hybrids. In sending us the answers that we print below, our correspondent remarks: "I hope the answers will draw a fuller discussion on this very interesting subject. No one appears to have studied the life history of the coffee flower, and without that it is impossible to say what its nature is. We know that it is hemephrodite and fugacious. But we do not know if self or cross-pollination is favoured by the sexual organs. The fact of its being a highly-scented flower seems to point to the latter alternative. Some short-lived flowers are self-fertilised while the flower (corolla) is still in bud. [This also occasionally takes place with coffee.—Ed.] My own opinion is that the coffee flower must be to some extent pregnated with foreign pollen. The bushes swarm with bees and smaller insects directly the flowers open."

*Question.*—Will a hybrid coffee plant, if perfectly isolated, give seed true to name and properties of hybrid?

*Answer.*—A coffee hybrid may not seed at all. Some hybrids are quite sterile, while the majority are less fertile than pure-bred species. But some are as fertile as the pure-bred plants. It is not known if a coffee hybrid has ever been produced—naturally or otherwise.

*Q.*—What are the best means of effecting isolation?

*A.*—To cultivate the hybrids separately from the pure-breds and to induce flowering at a slightly different season.

*Q.*—Would not the best method to perpetuate the hybrid be to graft it on to the pure-bred stock?

*A.*—It is by careful selection of the fittest, especially in the seed, that the hybrid element in a plant is best preserved. Hybrids have usually a tendency to revert to the conditions of their ancestral stock. Mere grafting would not protect a hybrid from the fertilising influence of pure-breds.

Being convinced that our correspondent had failed to grasp the meaning of our last question, we put it again in a different form and at greater length. The following is the answer:—

"I'm afraid I misunderstood your original question *re* the preservation of kind by grafting. But as now put, your meaning is very clear. As the desirable qualities possessed by an individual plant are not always (indeed rarely) reproduced from seed, it is usual to propagate such an individual by the insertion of buds, cuttings, layers and grafts. By these modes of propagation the actual characteristics of the kind are reproduced and multiplied. The coffee bush can be readily propagated by the insertion of cuttings and layers, so that there is no necessity (unless for a particular purpose) to undertake the more laborious process of grafting. It is also feared that grafted bushes would get broken by the wind on most estates. But however that may be, the fact remains that special qualities in habit, growth, size or yield, may in each case be retained by divisional propagation. Where grafting is desirable, with all materials at hand, a man and boy, earning together about Rs. 12 per mensem, could easily turn out 100 grafts a day; and if a little pressure was put on, 150. But taking the smaller estimate, 3,000 grafts for 12 rupees is not a heavy matter."

A natural query arises: how about the Brooke-Mockett hybrid? From the above it would seem clear that high cropping powers cannot be expected from hybrids. The greatest advantage to be derived would be perhaps to get a tree nearly equal to Arabica in cropping powers, with the hardier constitution of Liberian. Further, that if a good hybrid *is* obtained, it is beyond all question that the safest way to propagate it true to name would be by cuttings or grafts, etc.

We do not ourselves claim to be an authority in any way on this question, but we would suggest that an easier and certainly much surer way of obtaining an extra-good strain of coffee would be by the methods so successfully employed at home in obtaining "pedigree" wheat. Devote a small and isolated field to seed-bearing alone. Rigorously cut out all poor croppers, and bestow the best and most thorough cultivation possible to the remainder. Note carefully the heaviest croppers, and among these, those freest from disease of any kind. Pick from the latter only, and plant from this seed another-seed-field. The process could be developed *adinfinitum*, with a gradually better result each generation. Another way would be to mark the biggest and healthiest croppers throughout the estate, and when pruning, or at some other convenient time, make cuttings or layers and plant these in as isolated a spot as possible. The seed from the best of these should be something quite out of the common, we believe.

We have invited other scientific correspondents to give us their views on Hybrid Coffee, and we should besides be very glad to hear also from practical planters on the same subject.—*Planting Opinion*, Sept. 12.

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## VARIOUS PLANTING NOTES.

Coffee and Tea Cultivation in Madras.—We read in the *Madras Mail* that the total number of tea plantations in the Madras Presidency, exclusive of Native States, on the 31st December, 1895, according to official returns, was 107, which employed 4,366 persons permanently throughout the year, and 604 temporarily during the busy season. The area under mature plants was 6,083 acres, and under immature plants 712 acres. 1,940 acres have been taken up for planting but have not yet been planted. The quantity of uncured leaf grown was 27,70,881 lb, and the quantity of leaf manufactured during the year was 645,658 lb. Of the 107 plantations 99 were on the Nilgiris, with a total area of 6,015 acres under cultivation and 209 acres taken up but not yet planted. The quantity of leaf cured was 579,680 lb. The number of coffee plantations in the Presidency, exclusive of Native States, was 13,033, which employed 19,902 persons permanently during the year and 15,366 persons temporarily 54,921 acres were under mature plants and 9,032 under immature plants. 59,968 acres have been taken up but not yet cultivated. The total yield for the year was 11,095,137 lb. There were 498 plantations on the Nilgiris with a total area of 24,869 acres. In this District 53,116 acres have been newly taken up but not yet planted. The yield in this District was 7,507,280 lb.

Cinchona Cultivation in Madras.—The total area under cinchona cultivation in the Madras Presidency during the year 1895-96, according to official returns, was 2,595·96 acres; but this is much less than the actual area as many of the planters have failed to furnish the required information. The largest area was on the Nilgiris 1,935·50 acres (but the figures according to the village accounts are 7,226·11 acres), with 2,461,803 mature and 505,209 immature trees. The outturn for the year is given at 402,909 lb. The area cultivated in Malabar was 618·50 acres with 261,350 mature and 11,000 immature tress. The outturn of bark was 308,439 lb. In Madura the area under cinchona was 4,495 acres. The plantations in this District are left to grow wild and are not barked, as it is not found profitable to work them. In Travancore 1,479 acres were under cultivation, with 798,674 mature and 296,000 immature trees. The outturn of bark was 506,350 lb. All the plantations in Cochin have been destroyed. The area of the Government cinchona plantations is 800·48 acres, containing 1,475,193 mature and 155,805 immature trees. The outturn of bark for the year was 229,700 lb. The quantity of bark harvested during any year in these plantations is regulated by the requirements of the factory and bear no relation to the amount which would be taken.

## PRECIOUS STONES.

BY PROF. HENRY A. MIERS, M.A., F.R.S.

From the earliest times certain minerals, which are conspicuous for their beauty, have been prized for decorative purposes: the brilliant green hue of malachite, the deep blue of lapis lazuli, and the rich colour of red jasper would naturally attract early attention. But these particular minerals are not numbered among the true precious stones; they do not possess the remarkable qualities which endow the diamond, the ruby, or the topaz with their peculiar attractiveness. The two essential qualities, namely, brilliancy and hardness, are only possessed by certain rare minerals; a brilliancy which makes them unrivalled for ornamental purposes, and a hardness which protects them from wear and tear, and makes them practically indestructible.

It is difficult, in a town like London, where every jeweller's shop is ablaze with diamonds, to realize that large and good stones possessing these qualities are so rare; that thousands of natives are toiling in the river beds of India, Burmah and Ceylon, washing out from the gravel or the sand the little blue and red pebbles which are to be converted by the lapidary's art into brilliant jewels of saphire and ruby. Even in that wonderful pit at Kimberley, where half the diamonds of the world seem to have been crowded together for the use of man, although, perhaps, ten tons of diamonds, worth more than £50,000, have been extracted in 25 years, yet those which weigh more than an ounce each may be counted on the fingers.

It is in the qualities of hardness and brilliancy that such minerals as malachite and lapis lazuli fail; owing to their comparative softness, they would not, if cut and polished, possess the sharp edges and brilliant surface of the emerald or sapphire, and would soon become dull and rounded by friction, even by the friction of ordinary dust. Again, since they are opaque, they can never flash like the sapphire or the emerald; and yet it is quite a mistake to suppose that the necessary qualities are confined to those few stones which are familiar to everyone, such as the diamond, ruby, sapphire, emerald, garnet, and amethyst. There are many others though they are not so well known I think we may fairly assert that such minerals as tourmaline, jaroon, peridote, spinel and chrysoberyl, though their names may be familiar, are not stones which would be recognised by any but those who are in some sense experts; while other minerals, such as sphene, andalusite, anixnite, idocrase, and diopside are possibly almost unknown to most people even by the reputation. Yet all these minerals possess qualities of transparency, hardness, and beauty of colour which render them extraordinarily interesting and attractive as precious stones. (A number of facetted stones cut from the less known mineral were thrown upon the screen by reflected light.)

Take first the hardness. A few years ago, the hardness of stones was a very important character in the eyes of the mineralogist; it was one of the characters by which they were invariably identified, and a distinguished German mineralogist drew up a table by means of which the hardness of minerals can be compared. Any stone is said to be harder than the minerals of this scale which it can scratch, and softer than those by which it can be scrtached. In the right hand column the gem-stones are arranged according to their hardness.

MOHS' SCALE OF HARDNESS.

| | |
|---|---|
| 1. Talc. | |
| 2. Gypsum. | |
| 3. Calcite. | |
| 4. Flour. | |
| 5. Apatito .. .. | Sphene. Opal. |
| 6. Felspar .. .. | Diopside. Moonstone. |
| | Epidote. Idocrase. Peridote. Axinite. |
| 7. Quartz .. .. | Quartz. Tourmaline. Cordierite. Garnet. |
| | Andalusite. Zircon. Emerald. Phenacite. |
| 8. Topaz .. .. | Spinel. Topaz. Chrysoberyl. |
| 9. Corundum .. .. | Ruby. Sapphire. |
| 10 Diamond .. ... | Diamond. |

Among precious stones diamond stands out pre-eminent as the hardest of all known substances. Ruby and sapphire are scratched by diamond alone, while chrysoberyl, topaz, and spinel scratch all the remaining stones, although they do themselves yield to the scratch of ruby and sapphire. The hardness is a character still generally utilised by the expert when he is in doubt; in experienced hands it has some value. By long practice it is possible to form a very close estimate of the hardness of a given stone, and that often, not by scratch of the other minerals in the scale, but by the feel of the stone against a file; the resistance offered by the stone to the file is taken as a measure of its hardness. It is not a character capable of any accurate measurement, neither is it to be recommended for use by inexperienced persons. I hope to show, as I go on, that we have now accurate methods of testing at our disposal which render the trial of hardness quite unnecessary. But, none the less, the character is one of great importance as investing the stone with durability; all the precious stones, except moonstone, opal sphene, have at least the hardness of quartz, and can barely be scratched by metals, even by hard steel.

Take, next, the quality of brilliancy. This depends upon two things—firstly, the manner in which rays of light are affected when they enter or leave the stone, and, secondly, the manner in which this action can be intensified by the art of the lapidary.

When light passes from one transparent substance to another it is bent or refracted as every one knows from the bent appearance of a stick plunged into water. Consider, now, a ray of light falling upon the surface of a transparent stone; a portion of the light is reflected, but a portion enters the stone. In passing from air into the stone, it is refracted inwards. When, on the other hand, it passes from a transparent stone into air, its course is reversed, and the emerging ray is refracted outwards or towards the surface. It is, however, with the emerging as with the entering light—the beam is sub-divided, only a portion is refracted out, another portion of the light is reflected within the stone.

It is very clear, then that of the light travelling in different directions within a diamond, a far larger proportion is internally reflected than is the case with any other stone. We shall see presently that it is this property which gives the diamond its consummate brilliancy.

Another effect produced by refraction is, as every one knows, the separation of ordinary light into rays of different colours—it is seen in any prism of glass. This property is known as the "dispersion" of light; and a stone which possesses great dispersion will exhibit a beautiful play of spectral colours—will exhibit a high degree of what is called fire. In this respect again the diamond is pre-eminent; its dispersion is nearly twice as great as that of other stones.

All these optical properties are beautifully shown by those unworked jewels of which the smooth facets have been produced by nature; I mean the crystals of the various minerals. The beauty of natural crystals of transparent minerals is largely due to the optical effects which I have just been describing.

The beautiful specimens of rock crystal, calc spar, topaz, emerald, and other stones which adorn mineral collections are sufficient evidence of these properties. But it is very certain that natural crystals, although they possess a beauty of form which is all their own, are not by a long way so brilliant as the facetted stones which are cut from them by the art of the lapidary; that a natural diamond is not so lustrous as a facetted brilliant.

In fact, many of the finest gem stones present a very mean and sordid aspect before they have passed through the hands of the lapidary; one has only to compare the dull and unattractive appearance of a parcel of rough rubies, sapphires or diamonds, with the finished jewels displayed in the jeweller's windows to see how much these owe to the lapidary's art.

In re-cutting the Koh-i-noor it was thought advisable to spend £8,000 on the process and to reduce its weight from 186 to 106 carats. When the great Pitt diamond was cut its weight was reduced from 410 carats to 137; and the fragments and dust removed were valued at £8,000; but the extent to which the stone was improved is indicated in the fact that having been purchased for £20,000, it was after cutting sold for £135,000.

To understand how the cutting of a precious stone adds to its brilliancy, we have only to trace the course of the rays within the stone, and consider how it can best be facetted in order that the light which enters in various directions on the upper side, or crown, may be reflected internally from facet to facet on the under side of the stone with as little loss as possible, and may be finally thrown out from the front of the stone. For this purpose the facets must be so arranged that as much of the light as possible within the crystal shall meet the facets at an inclination exceeding the angle of total reflection. A brilliant with its 58 facets is one of the forms which experience has shown to be best adapted for the purpose. How little of the light gets through a stone so facetted, and, therefore, how much of it is totally reflected internally, is easily shown by holding the stone in a strong beam of light; first so that the light is reflected, and then so that the light shall, if possible, be transmitted. In the latter case, the stone merely throws a dark shadow, indicating that little light, if any, has passed through it.

A facetted stone is always cut from a single crystal, and not from an ordinary lump of the mineral, which is generally a mass of crystals. The chief reason why jewels are cut from natural crystals is that these, by virtue of their crystalline nature, are remarkably homogeneous, and therefore clear and limpid when free from cracks and flaws. A stone which is not homogeneous can never have the purity and limpid brilliancy of a single crystal, for at every point of contact of one part with another reflexion takes place. Among minerals used as precious stones which are not crystals, may be mentioned the opal. The opal probably owes its peculiar beauty to the very fact that it is filled with minute cracks or cavities, each of which contributes some tint of colour by reason of its extreme thinness, just as the colours of a soap-bubble are due to the thinness of its film.

Or take the agate. Here the stone consists of layers of different materials differently coloured. Its beauty is of a totally different nature from that of clear crystals, which it can never rival in brilliancy. Stones like the agate are generally classed apart as semi-precious stones, and their interest depends upon beauty of structure or colour, or possibly to a large extent upon their rarity. The turquoise, for example, is a very rare stone, which is apparently absolutely uncrystallised, but possesses great beauty of colour, and is therefore much prized. The same is true of carnelian. On the present occasion we are not concerned with those opaque or curiously structured minerals whose beauty resides almost solely in their colour.

Those who have had no practical acquaintance with minerals, have little idea how variable and accidental are their colours. They may scarcely realise that the ruby and the sapphire are the same mineral, and that this mineral also occurs, and is used in jewellery, absolutely colourless when it is known as lux sapphire, green as the so-called Oriental emerald and yellow as the so-called Oriental topaz, that topaz itself may be yellow, brown, blue, or colourless; that zircons range from colour-less through almost all conceivable shades of brown and green, and that even diamond has been found green, red and blue.

When we came to consider the properties by which precious stones are recognised, I shall say little or nothing about colour, for it is of little value as a criterion. There are, for example, certain red stones which the most skilful experts cannot by their colour alone refer with certainty to ruby, garnet or spinel. It might be expected that a noteworthy difference in chemical composition would accompany this difference of colour, or that the pigment could be ascertained by analysis. In reality, this is scarcely ever the case. It is fairly certain that the emerald owes its colour to the presence of chromium, but the variation in the analyses of precious stones cannot generally be attributed to anything indicated by the variation of colour.

The chemical composition, though of great general importance in mineralogy, is of little practical value in the discrimination of precious stones, since it is usually impossible to sacrifice a sufficient quantity for chemical analysis. If we are dealing with a facetted stone, not even the smallest portion can be utilised, for fear of injuring it.

There is, however, one remarkable optical property, which is ultimately related to the chemical composition. As is well-known, many substances possess the property of absorbing certain rays of light. When the solar spectrum produced by admitting ordinary daylight through a slit, and transmitting it through a prism, is passed through the glowing vapour of certain substances, particular rays of light are absorbed, and their absence from the emerging light is manifested by corresponding dark bands in the spectrum. The instrument by which the observations are made is the spectroscope. It is well-known to most people that the solar spectrum itself contains certain dark bands of this sort, which are produced by vapours that can be identified by the position of the bands in the spectrum; and thus it is possible to ascertain something regarding the chemical constitution of the sun and certain of the heavenly bodies. Now, a precisely similar effect is produced by certain elements if present in a mineral, by merely transmitting the light through a piece of it. Thus, transparent minerals which contain the rare element didymium, betray the presence of that element as soon as they are viewed through a spectroscope by ordinary daylight; the spectrum is seen to be traversed by black bands in the green, which are quite characteristic.

Among gem stones there are two which possess this curious property. One is the variety of red garnet, known as almandine, and the other is the jargon. The almandine produces characteristic bands in the green, and the jargon in the red, green and blue portion of the spectrum. To see these remarkable absorption spectra, to which attention was first called, I think, by my friend, Professor Church, it is not necessary to look through the stone, it is quite sufficient to place it in a strong light, and look at it through an ordinary pocket spectroscope; the light which enters the instrument consists largely of rays which have penetrated the stone, and been reflected from the facets at the back. These rays produce the absorption spectrum. In this way we are enabled to identify a jargoon or an almandine merely by looking at it. There is no test so simple or so easy of application. It is curious that the almandine, or iron-aluminium garnet, is the only garnet which presents an absorptive spectrum, and it is not yet certain to what element the bands are due. In the case of jargoon, they are supposed to be caused by the presence of some uranium compound in the mineral. All the almandine garnets which I have examined, and nearly all the jargoons, show these characteristic absorption spectra.

By way of summary, I have thought it desirable to indicate the general characters of precious stones in a diagram, which exhibits some of their relationships and also some of their differences in a graphic manner.

Opal, which is a comparatively light mineral, has a low refractive power; zircon or jargoon is a heavy mineral, and has a high refractive power. Let now the refractive power of any mineral (as measured by its refractive index for yellow light) be represented by a corresponding length set off from left to right, and let its density (as measured by its specific gravity) be represented by a corresponding length measured downwards. Fixing in this way a point corresponding to opal, and another representing the character of zircon, draw a straight line from the one to the other. It will then be found that the points which, by their position on the diagram, represent the specific gravity and refractive index of the various minerals, will be very nearly upon this line; that is to say, as the refractive index of precious stones increases, so also does their density, and the two increase together in a remarkably regular manner.

It appears that those minerals which, by their high refractive power, possess the greatest brilliancy, possess also the highest specific gravity or weightiness; that the precious stones are therefore all heavy minerals. There is also a rough general correspondence between these characters and the hardness of the stones; the brilliant heavy minerals are also generally speaking hard.

Two remarkable exceptions display themselves. Sphene lies far to the right of the position which it should occupy according to its specific gravity; it possesses an extraordinarily high refractive index, and is, therefore, an extremely brilliant gem stone. On the other hand, a glance at the scale of hardness shows that it is, unfortunately, one of the possible gem stones, and that in this respect it is not very well fitted for jewellery.

Diamond is still more remarkable; its refractive index places it at the extreme right of the diagram, with a refractive power, and therefore a brilliancy, greater than that of any other stone; at the same time its hardness exceeds that of any mineral, and this combination of qualities renders it the chief among gem stones, unequalled for brilliancy and durability, although not a heavy mineral. Moreover in dispersion, and therefore in fire, it stands alone. Minerals which are heavier than zircon, such as the metallic sulphides and iron-glance, are unsuitable for gem stones since they are nearly opaque, but they follow the same law, and possess a refractive power still greater than that of zircon or even diamond.

There is one other stone which is exceptional but in less degree and in the other direction, namely, topaz, whose refractive index is not 1·7, as it should be by its position on the line due to the specific gravity, but 1·62; the point corresponding to topaz must therefore be placed a short distance to the left of the line. It is curious that these three exceptional stones lie on the same horizontal line, having all the same specific gravity 3·5.

In mentioning the specific gravity I have introduced a property which is not essential to win esteem for a precious stone, but one which is of great value in its identification.

We have next then to consider those properties by which precious stones may in practice be most readily recognised. The table shows very clearly that specific gravity is one such property. The meaning of specific gravity is easily explained. A piece of tourmaline of any size weighs three times as much as an equal volume of pure water at 4° C., the specific gravity of tourmaline is therefore said to be 3; a piece of almandine garnet of any size weighs four times as much as an equal volume of water under the same conditions, and the specific gravity of garnet is therefore 4.

Now any substance immersed in water loses in weight by an amount exactly equal to that of the water displaced. Hence to ascertain the specific gravity it is only necessary to suspend the stone by a fine thread to the beam of a balance and weigh it first in air, and then immersed in water. The first weighing gives the weight of the stone itself, the difference between the first weighing and the second gives the weight of the displaced water; hence the specific gravity is found at once by dividing the weight of the stone by this difference. For very small stones, where the weights concerned are slight, it is necessary to use a refined chemical balance. But for ordinary stones a well made Westphal balance is sufficient.

The Westphal balance is constructed on the principle of the common steel yard. At one end of the beam is a counterweight, at the other end the stone is suspended; the beam is divided into ten equal parts. A weight can be suspended on the beam, and its action, of course, varies with its position on the beam; at the tenth division from the centre it has a value ten times as great as at the first division.

The specific gravity is then found as follows:—First, counterpoise the counterweight. Let this require a weight, A, on the right hand side of the beam. Next, find the weight necessary to restore equilibrium when the stone is suspended from the beam. Let this be B. Then A—B is the weight of the stone in air. Next, raise the vessel of distilled water below the stone until it is immersed. If C be the weight now required to restore equilibrium, C — B is the loss of weight in water.

and, finally, the specific gravity is $\dfrac{A - B.}{C - B.}$

This process is known as "hydrostatic weighing," and can be applied to any stone, except such as are very small. Great precautions must be taken, in order to determine the specific gravity with accuracy. Especially is it necessary to free the stone from all adhering bubbles of air. For this reason the process of hydrostatic weighing is a somewhat laborious one.

Now, in order to identify a mineral, it ought to be unnecessary to determine exactly the specific gravity, provided that means can be devised for showing that its specific gravity is the same as that of some known substance. For purposes of identification, a comparative method is often quite as efficacious, and much more easy than acual measurement. This may now be done by means of certain heavy liquids.

Wood floats in water because it is lighter than water; iron sinks because it is heavier; but a substance which possessed exactly the specific gravity of water would neither float nor sink, but would remain suspended in the water like a baloon in mid air. Take, then, a liquid which is heavy—the most convenient is methylene iodide, whose specific gravity is 3·3—a fragment of zircon will sink in this, and a fragment of tourmaline will float, but a fragment of the mineral augite, whose spacific gravity is also 3·3, will exactly remain suspended.

This liquid, then enables one to say with certainly whether a given stone has a specific gravity greater or less than 3·3; in the one case it will sink, in the other it will float.

But methylene iodide further possesses the valuable property of mixing easily with benzene, which is a very light liquid. Every drop of benzene added reduces the specific gravity of the mixture, which can thus easily be made to range between that of chrysolite and that of opal. To identify any one of the stones which lie between those limits on the diagram, it is only necessary to drop it into a test tube or small vessel containing methylene iodide—the stone will float—benzene is added drop by drop, the mixture being kept well stirred until a point is reached at which the stone neither sinks nor floats. Then different fragments of mineral possessing specific gravities between 3·3 and 2·5 are taken in order of increasing density and dropped into the liquid; the stone under examination possess a specific gravity between that of the last which floated, and the first which sinks, and the limits may, if necessary, be further narrowed by comparing it with other mineral fragments of known density intermediate between those two. One great advantage of this

method is that the size of the fragment does not affect the result; a minute fragment only just large enough to be visible is equally convenient; in fact is more convenient than a larger one.

If a stone in the rough is under examination, a mine chip can easily be taken from it, and used for the experiment in the most satisfactory manner. The method is moreover extremely sensitive; a mere drop of benzene added to a considerable volume of the liquid is sufficient to send to the bottom a stone which was previously floating.

So much for stones whose density is less than that of chrysolite. As regards the denser minerals, it was until a short time back impossible to test them by any such method they all sank in the heaviest liquid available. But now, thanks to the fortunate discovery by Dr. Retgers of the remarkable properties of thallium-silver nitrate, all the known gem stones may be distinguished by a similar process.

This salt, which may be prepared by fusing together in equal molecular proportions nitrate of silver and nitrate of thallium, possess the remarkable property of fusing at a temperature far below that of either of its constituents, and well below that of boiling water, while at the same time the fused salt possesses a specific gravity greater than that of zircon. The salt fuses at 75° C. to a clear colourless liquid in which zircon just floats; it further possesses the useful property of being miscible in all proportions with water, so that the specific gravity can be reduced to any desired extent by adding water, just as that of methylene iodide was reduced by adding benzene. The substance can be kept liquid by maintaining it at a temperature above 75° C., and this may easily be done by immersing the vessel in which it is obtained in water heated to near the boiling point.

In these two liquids then we have the means of producing a liquid of any required density for the discrimination of gem-stones, since we can obtain from one or the other a liquid in which any precious stone will be exactly suspended.

The nitrate might be, used by itself to include the whole series, but it is more convenient to use the methylene iodide when possible, both because it can be employed at ordinary temperatures and because it is cheaper than the nitrate.

Both substances darken on exposure to light, and should be both kept and used in the dark as far as possible; they are easily freed from the liquid employed to dilute them. The benzene readily evaporates spontaneously from the methylene iodide, and the water can be driven off from the diluted thallium-silver nitrate by boiling.—*Journal of the Society of Arts*, Aug. 14.

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## THE BANANA TRADE OF FIJI.

In a recent article we suggested that the future export of fruit from this colony would require to be conducted on ever improving conditions if the hold we at present possess in the Colonial markets is to be maintained. We also indicated the nature of the competition we had to encounter by reason of the superior facilities that were being offered by the Colonial governments with the intention of encouraging growers to build up a permanent fruit industry. It would be well, that, that the people of this colony—no less the commercially interested than the actual producer, for the whole fruit industry is inextricably associated re- the one interest with the other—let no opportunity escape them to keep abreast with their neighbours, in assisting the producers in every way possible, by facilitating despatch and by all other conceivable means. Our largest export of bananas in any one single year was equal to 803,629 bunches in 1892, and since that year the decline in shipments has been very marked, specially to Australia. No doubt the circumscribed purchasing power of those colonies, consequent upon the evils left in the trial of the Banking Crisis, had much to do with the decline, but was not wholly responsible for it. We have to look nearer home for the causes which led to the great duction of the output, and opened the door, so to speak, for our neighbours to avail themselves of our neglected opportunities. Meantime Queensland, New Hebrides, Rarotonga, Norfolk Island, and the Friendly Islands have stepped into the breach, which we through our clumsiness so obligingly left open, with the result that, now the colony is inclined to re-enter the arena with new vigor, it has a strong competition to encounter. Notwithstanding this, however, with the excellent quality of our fruit, for which it is famed, with fast and direct communication, and with the experience which we have gained in the hard school of adversity, the probability is that we shall regain our former position in the trade; while the addition competition, generally spoken of as the soul of business, which we have now to face, should lend a zest to the campaign to which before we were strangers. It is needless to recount all our previous shortcomings in connection with this trade; sufficient to say they were many and varied. The principal of these however were over-shipment, non-grading, neglect of seasons, rough handling, and the practice of shippers breaking up their shipments into various consignments, and so permitting the fruit grown on one plantation to enter into competition when it reached the open market, the one consignment with the other in the same city. All these mistakes of former years will require to be carefully guarded against or, at any rate, mitigated as much as foresight can suggest. Of times of old when fruit has been rushed into, say, the Sydney market, if such an act of vandalism could have been justified, it would have been largely to the advantage of shippers if half the fruit had been thrown overboard, and by this rough mode a glutted market would have been avoided. Producers will have to guard as much as possible that the markets are not flooded with fruit. The difficulty is not easy of solution, but from past experience we are aware that it would be preferable that the fruit should be permitted to rot on the plantation rather than that it should go forward to a market that is over-supplied. Manufactures, of course, have a large advantage over fruit producers, but they are ever on the watch to prevent their goods flooding a market—and the output of their wares is restricted accordingly. Nevertheless the same law, that of supply and demand, governs the sale of both produce and manufacture. The difficulty to be coped with, would be very much minimised were cable communication practicable, so as to admit of the early receipt of the state of the various markets. Possibly the proposed Pacific cable will be completed and at our disposal by the end of 1898; meantime it is imperative that reliable information as to the requirements of the market should reach the colony at the earliest possible moment. How this is to be obtained is a matter for consideration. To be effectual, the information requires not only despatch but it must be unimpeachable, and to secure this, it would appear to be necessary that the services of smart business men be retained on behalf of the colony at the three centres of Sydney, Auckland, and Melbourne. And if it then be deemed necessary in the interest of the industry to secure the aid of these gentlemen, their services

should be availed of to regulate the markets in so far as consignments from this colony are concerned in their respective circuits, by Fiji shippers consigning the whole of the fruit to their charge. It must not be forgotten that, while only a fair price is what is aimed at by these extra-precautions regulating shipments, if they are neglected then it would be better that there was no fruit trade in so far as Fiji be concerned. Make no mistake, as soon as a single bunch goes into the market more than it can consume, then the market becomes at once demoralised—hence unprofitable. And it were well in the interest of the industry that the colony is once more endeavouring to build up, without it is to be of an ephemeral character, that the producers and exporters meet together and form some kind of a co-operative combination in Suva, in order that they may regulate shipments on some business lines. We are aware, of course, that efforts in this direction have been made before, and that success has not been achieved; had it been otherwise the decline in our former fruit enterprises would not have occurred. Possibly too much has been aimed at, and hence the failure. Nevertheless, like errors may be avoided on this occasion, and the industry, as it presents itself at this time, is so much the richer in that it is fortified with those results already ascertained—and paid for. As the matter stands at present we have indicated that the trade to be reconstructed on a permanent basis requires to be regulated at the port of shipment and the port of delivery, and the sooner this is accomplished the better it will be for those more particularly interested before the volume of business attains proportions that will materially hamper the position. Now is the time, while shipments are curtailed, to formulate future proceedings, Legislative or otherwise. We mention legislative, because in the interest of the industry the suggested meeting of producers and shippers may deem it advisable to ask the Government to provide the funds necessary to the appointment of supervising agents in the colonies—and this would possibly entail a small export duty on each bunch or case of fruit. As regards the regulation of the shipments at this end, the expenses should be no more than each shipper could well afford to liquidate out of his private pocket. Were the system adopted that all fruit put on board ship—never mind by whom appraised on a general average principle according to grade of fruit which might for convenience sake be graded in the colonies) and the whole shipment dealt with as one venture, there would be little room for dissatisfaction on the part of any shipper, as the proceeds of the whole cargo would be divided according to its grade. If an exporter sent second-class fruit, he would only receive account sales for second-class fruit—and so on. Either some such plan as here suggested must be adopted or the fruit industry has a much harder experience to undergo before success is attained.

Further remarks on this subject are held over for another opportunity.—*Fiji Times*, Sept. 5.

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In our last article we suggested that the rough handling of bananas had much to do in contributing to the undoing of past ventures; that where profits were wont to be looked forward to the actual result in very many instances was ruinous, alike to individual as to the industry as a whole. Rough handlnig yed its part and is largely responsible for collapse that followed after the zenith year—1892. The rough and tumble of that yea brought the climax to a trade that should otherwise have been a remunerative and permanent industry; in place of which plantations were abandoned, the service of numbers of vessels and employees was dispensed with, trade restricted, and the large ocean steamers engaged in the transport were replaced by smaller ones or altogether withdrawn, the Colony's revenue suffered a shrinkage and altogether the country lost prestige. This is only a modified sketch of the past. What are the conditions to be observed in connection with this industry for the future? The same errors are surely not to be again repeated. The whole history in connection with the fruit industry the world over, instructs us that good varieties of fruit carefully grown, tenderly handled and forwarded to market in good condition, will always command a purchaser. It will be well, then, to bear this in mind in all future transactions.

As a rule the ordinary citizen has a good deal of respect for what is termed vested interests—why, we have never bothered ourselves to understand. Even the publican, when the prohibitionists, who surround him, are of opinion that the air would be purer by the closing of it, it may be The White Lion or the Honest Lawyer, is up in arms at once with "No! You don't respect my vested interests, please." And the landlord is generally pretty safe behind his barrier of vested interests. Nevertheless, we would like to know what the vested interests of the Sydney fruit merchant comprise, and by what right he insists on receiving bananas in naked bunches in place of well-protected cases. If it be because it has been the custom to so receive the fruit it must have originated in our past carelessness in having forwarded it to him in an unprotected condition. Notwithstandig this barrier cry of "Custom! Custom!" it is quite time that the practice was discontinued, more especially as we are aware that so soon as the Sydney dealer receives the fruit, a large portion of it is at once put up in cases for country customers. In fact the work that ought to have been performed on the plantation is done in Sydney. This is one of the anomalies in connection with the trade that requires attention. The fruit is grown in Fiji, carried perhaps a mile to the river or beach, put on board some small craft, then into the larger stream, carried to Sydney, put on the wharf there, then transferred to cart, dumped down in a store, and then—the packing process commences. And at whose cost is all this damage entailed to the fruit en route debited but to the producer—and the middle man benefits by the transaction. Had the fruit been packed on the plantation no waste or destruction would have entailed, and the interests of the producer and consumer would have been conserved. Possibly, and we have our doubts about it, it might serve the interests of a few people in Fiji to so send their produce to market, but that the practice should be longer continued as a general custom is very much to be deprecated. After all, the city of Sydney,

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while its consumption of bananas may be comparatively large, still its 300,000 of population is small in comparison to the large number of cities and towns which draw their supplies from the Sydney emporium. The population of Australia, leaving Queensland out of the question, amounts to close upon 3,000,000.

If this barrier of Custom which presents itself is inimical to the profitable conduct of the trade, the sooner it is broken down the better it will be for all concerned. If the middle men of Sydney will not co-operate with the shippers of this colony in their efforts to put fruit on the market on more practical economic conditions then they will only have themselves to blame if other means are taken to reach the consumer without their assistance. By last mail we are in receipt of advices from Sydney—"Don't send any bananas in cases. If you do so they will not realise charges." It would be well, then, if the exporters were to meet together and consider this matter in all its detail. The necessity, under any circumstances, of casing a large portion of the fruit is shown by it being done when it arrives in the colonies. As we are all aware in this country much of the finest fruit fall off the bunches and never reaches the consumer, without it happens to be the colonial wharf longer. Again, much of the best fruit is on the smaller bunches which are not considered of full size in the market acceptation of the term but, cut up and sent to market in cases, the fruit would be much appreciated by the consumer, and, at the same time, the waste which is at presen entailed would be avoided and the extra profit that must accrue would also be much appreciated by the producer. It is the timely consideration of all these small detail in economic working conditions that make the difference between profit and loss, and as the contest for position in the market goes on apace, it were well that they be not disregarded until too late in the day.—*Fiji Times*, Aug. 8.

## VARIOUS PLANTING NOTES.

MACHINE-MADE TEA IN CHINA.—A Colombo merchant in sending us an order writes :—"Certain friends in China have asked me to send them the best books on the above subject as they seem to think there is a chance of making tea in China by machinery. I can't say I share my friends views, but I must comply with their request nevertheless. The Chinese will never use machinery as long as the tea gardens are owned and managed by Chinese."

TOMATO, A FRUIT OR VEGETABLE.—The Tomato, from a botanical standpoint, is a fruit. It is also used as a dessert fruit by many people. In regard to exhibiting this vegetable product, it has been found convenient by most societies to include it with the vegetables or salads, and the decision of the judges in your case was by no means extraordinary. In the *Rules of Judging*, issued by the Royal Horticultural Society, which for the present should be the recognised authority for the settlement of such points, is the following:—"Tomatos are only recognised as dessert fruits where specifically admitted by the particular schedule, thus :—'Tomatos admissible.'" —*Gardener's Chronicle*, Aug. 15.

**The Best Soaps for Warm Climates are** CALVERT'S TOILET SOAP (6d. Tablets) and PRICKLY-HEAT SOAP (6d. and 1s. bars), pleasantly perfumed, for Bath or Toilet containing 10 per cent. of Pure Carbolic. Very serviceable as preventives of Prickly-heat and other skin irritation. Sold at Chemists, Stores, &c.

F. C. CALVERT & CO., Manchester.

## INDIAN TEA SALES.

From *Watson, Sibthorp & Co.'s Tea Report*)

CALCUTTA, Sept. 16th, 1896.

32,231 packages changed hands in the sales held on the 10th instant. The market was quiet and prices for all grades of tea were again lower, full rates alone being obtained for a few lots of choice tea. There was a good demand for outside markets and buyers secured about 6,000 packages.

The average price of the 32,231 packages sold is As. 7-6 or about 8½d. per lb. as compared with 24,123 packages sold on the 12th September 1895 at As. 8-4 or about 8¾d per lb. and 18.967 packages sold on the 13th September 1894 at As. 8-9 or nearly 9¼d per lb.

The exports from 1st April to 14th September from here to Great Britain are 57,079,453 lb. as compared with 55,709,797 lb. at the corresponding period last season and 54,951,184 lb. in 1894.

NOTE.—Last sale's average was As. 7-8 or nearly 8½d.

TELEGRAMS.—Reuter telegraphed from London on the 7th instant—"Type" 7½d, on the 8th instant —"Type" 7½d, on the 10th—Offered 29,000, sold 25,500 packages. Generally very firm with full rates. Average 10d. "Type" 7 7-16d, and on the 4th —"Type" 7 9-16d.

EXCHANGE.—Document bills, 6 months' sight, 1s 2⅜d.

FREIGHT.—Steamer—£1-3-9 per ton of 50 c. ft.

(From *William Moran & Co.'s Market Report.*)

CALCUTTA, Sept. 16th, 1896.

TEA.—The sale of the 3rd instant, comprised 19,725 chests, of which 19,491 sold. Prices generally were rather weaker, finest kinds selling about half-an-anna lower and medium sorts showing a similar or rather greater decline. Common descriptions were slightly easier. On the 10th a large quantity was brought forward, 32,910 chests being offered of which 32,493 found buyers. Fine teas were steady and common descriptions very firm. Medium sorts again were rather lower.

Total quantity of Tea passed through Calcutta from 1st April to 14th September.

| | 1896. | 1895. | 1894. |
|---|---|---|---|
| Great Britain .. | 57,537,427 | 55,497,187 | 54,881,379 |
| Foreign Europe .. | 158,753 | 161,288 | 119,389 |
| America .. | 379,844 | 455,988 | 171,357 |
| Asia .. | 2,035,389 | 1,977,007 | 1,592,354 |
| Australia .. | 2,474,113 | 3,070,754 | 2,213,874 |
| | 62,585,526 | 61,162,224 | 58,378,353 |

PRODUCTION OF ESSENTIAL OILS IN SICILY.—Ceylon is, to some extent interested in the following informtation :—

Owing however, to the measures taken of late to guarantee the genuineness of the Sicilian essential oils, these have redeemed their character and regained their place on foreign markets. The value of the volatile oil depends wholly on the variety of the citrus whence it is expressed, and that squeeezed from the peel of the bergamot is the most highly prized, that of the lemon coming next, while the orange essence only occupies the third place in the scale of values. The quantity of essential oils shipped to all countries during 1895 was 37,941 kilogrammes, valued at 588,085 lire (lire=9 9-16d), and the large proportion of 32,010 kilogrammes out of this quantity was taken by Great Britain, the value of the same being 224,070. The figures for 1894 were—total 52,422 kilogrammes, worth 733,908 lires; and to Greet Britain 45,626 kilogrammes valued at 638,764 lire. It should however, be mentioned here that in this instance at least the custom-house valuation is apparently greatly in excess of the actual market value of these essences.—*Journal of the Society of Arts*, Aug. 21.

## (COLOMBO PRICE CURRENT.

*Furnished by the Chamber of Commerce).*

Colombo, Sept. 21st, 1896.

Exchange on London: Closing Rates, *Bank Selling Rates*:—On demand 1/2⅝ to 5 32; 4 months' sight 1/2 5-32 to 7-32; 6 months' sight 1/2 3-16.

*Bank Buying Rates*:—Credits 3 months' sight 1/2 11-32 to ⅜; 6 months' sight 1/2 11-32 to 7-16. Docts. 3 months' sight 1/2⅜ to 13-32; 6 months' sight 1/2 7-16.

Coffee.—Plantation Estate Parchment on the spot per bus., R16·00 to 17·00 Very scarce. Estate Crops in Parchment,delivery no quotations. Plantation Estate Coffee, f.o.b. on the spot per cwt. 85·00 92·50. Liberian parchment on the spot per bushel, 12·50 to 13·00. Garden and Chetty Coffee, f.o.b. per cwt. no quotations. Native Coffee f.o.b. per cwt. R73·00 76 00.

Tea.—Average Prices ruling during the week: Broken Pekoe, per lb 57c. Pekoe per lb 44c. Pekoe Souchong, per lb 35c Broken mixed and Du t, per lb 29c.—Averages of Wednesday's sale.

Cinchona Bark.—Per unit of Sulphate of Quinine per lb 01½c. to 03½c.—1 to 4 %

Cardamoms.—per lb R1·40 to 1·80.

Coconut Oil.—Mill oil per cwt. 14·00 to 14 25. Dealers' oil per cwt. R13 75 to 14·00. Coconut oil in ordinary packages f.o.b. per ton. R315·0.

Copra.—Per candy of 560 lb R39·00 to 47 00

Coconut Cake: (Poonac) f.o.b. per ton, R60 to 77·50.

Cocoa.—Unpicked and undried, per cwt. R25 to 35·00

Coir Yarn.—Nos. 1 to 8 { Kogalla per cwt. R9 to 18. Colombo „ R7 to 14.

Cinnamon.—Nos. 1 & 2 only f.o.b. 66½c. Ordinary Assortment, per lb 63c.

Ebony: per ton.—R75·00 to 195·00.—Last Govt. sales.

Plumbago:—Large Lumps per ton, R130 to 310. Ordinary Lumps per ton, R130 to 260. Chips per ton, R70 to 120. Dust per ton, R30 to 90.

Rice.—Soolye per bag, R8·25 to R9·50.
Pegu and Calcutta Calunda per bag R8·75 to R9.25.
Coast Calunda per bushel, R3·25 to R3·41
Muttusamba per bushel, R3·25 to R3·75.
Kadappa and Kuruwe per bushel—No quotations.
Rangoon Raw 3 bushel bag R9 00.

Freights.

| Cargo. | Per ton London per str. | N. York per str. | Trieste per str. | Mar'lles per str. | *Hamb', Bremen &c. |
|---|---|---|---|---|---|
| | s. d. | s. d. | s. d. | s. d. | s. d. |
| Tea | 10/ | 22/6 | 12 6 | 25/ | .. |
| Coconut Oil | 10/ | 22/6 | 12/6 | .. | .. |
| Plumbago | 7/6 | ... | 12/6 | .. | .. |
| Coconuts in bags | 7/6 | .. | 12 6 | .. | .. |
| Other Cargo | 7/6 | .. | 12/6 | 15/ | .. |
| Broken Stowage | 5/ | .. | 12 6 | .. | .. |
| SAILERS. | | | | | |
| Coconut Oil | .. | .. | .. | .. | .. |
| Plumbago | .. | .. | .. | .. | .. |

Hamburg 7/6; Bremen 7/6; Antwerp 7/6; Genoa 10/.

## LOCAL MARKET.

*By Mr. A. M. Chittambalam, 7, Baillie St., Fort.*

Colombo, Sept 29th, 1896.

| | | |
|---|---|---|
| Garden Parchment :— | Scarce | per bushel |
| Chetty do :— | do | do |
| Native Coffee Scarce:— | 71·00 to 72·00 | per cwt |
| do f.o.b. do :— | 76·00 to 77·00 | do |
| Liberian Parchment, | 12·00 | per bushel (nominal) |
| do Coffee | 63·00 to 64 00 | per cwt |
| Cardamoms.— | 1·00 to 2·00 | per lb (nominal) |
| Cocoa.—(nominal) | 32·00 to 40·00 | per cwt do |
| Rice.—Market very high:— | | |
| Kazla | R7·50 to 8·00 | per bag |
| Soolye | 8·25 to 9·25 | do |
| Callunda Scarce | 9·00 to 9·50 | |
| Coast Callunda | 3·15 to 3·30 | per bushel |
| Kuruve (Scarce) | | |
| Muttusamba | 3·37 to 3·62 | do |

Cinnamon.—Quoted Nos. 1 to 4, at 64c and Nos. 1 and 2 at 68 cents pe lb (nominal)

Chips.—R85·00 to 87·50

| | | |
|---|---|---|
| Coconuts.—Ordinary | R35·00 to 40·00 | per 1,000 (nominal) |
| do Selected | 41·00 to 43·00 | do do |
| Coconut Oil.— | 14·25 to 14·50 | per cwt do |
| Copra.—Market Steady:— | | |
| Kalpitiya | R45·00 to 45·50 | per candy |
| Marawila | 43·00 to 44·00 | do |
| Cart Copra | 38·00 to 42·00 | do |
| Poonac.—Gingelly | 70·00 to 85·00 | per ton |
| Chekku | 70·00 to 75 00 | do |
| Mill (retail) | 65·00 to 70·00 | do |
| Ebony.—quotations at | R100 to R195 | (nominal) |
| Satinwood.—cubic feet | 2·00 to 2·25 | do |
| Halmilla.— do | 1·25 to 1·50 | do |
| Kitul Fibre.—Quoted at R28·00 | | per cwt (nominal) |
| Palmyra Fibre.—Quoted nominally:— | | |
| Jaffna Black.—Cleaned (Scarce) | | |
| do Mixed | R18·50 to 19·00 | per cwt. |
| Indian do | R7·00 to 9·00 | do |
| Do Cleaned | 10·00 to 14·00 | |
| Sapan Wood.—Quoted | 55·00 to 60·00 | per ton |
| Kerosine Oil—American | 7·50 to 7·55 | per case |
| do Russian | 3·15 to 3·20 | per tin |
| Kapok.—Cleaned f. o. b.:— | R29·00 to 30·00 | per cwt |
| do Uncleaned (new) | 7·50 to 8·00 | do |
| Croton Seed | 13·00 to 17 00 | do |
| Nux. Vnomica | 2·50 to 3·00 | do |

## CEYLON EXPORTS AND DISTRIBUTION

1895-1896.

| COUNTRIES. | Coffee cwt. Plantation | N'tive | Total. | Cinchona. 1896 B'nch & Trunk lb | Tea 1896 lb. | Tea 1895 lb. | Cocoa cwt. | C'moms lb. | Cinnamon. Bales lb. | Cinnamon. Chips lb. | Coconut Oil 1896 cwt. | Coconut Oil 1895 cwt. | P'bgo. 1896 cwt. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| To United Kingdom .. .. | 10833 | 27 | 10860 | 761308 | 68251012 | 64207556 | 23044 | 83410 | 550760 | 182320 | 50486 | 88984 | 86342 |
| „ Austria .. .. | 487 | .. | 487 | .. | 29454 | 2573 | 97 | .. | 5300 | 83100 | 17063 | 15707 | .. |
| „ Belgium .. .. | 27 | .. | 27 | .. | 24308 | 8113 | 127 | 2000 | 66700 | 66188 | 1919 | 3204 | 10776 |
| „ France .. .. | 459 | .. | 459 | 6478 | 44442 | 31697 | 373 | 3000 | 49800 | 3500 | 114 | | 2005 |
| „ Germany .. .. | 563 | 6 | 569 | .. | 61829 | 176738 | 886 | 33013 | 282501 | 111622 | 7188 | 10741 | 22957 |
| „ Holland .. .. | .. | .. | .. | .. | 3889 | 10781 | .. | .. | .. | .. | 400 | .. | 501 |
| „ Italy .. .. | 20 | .. | 20 | 4188 | 7257 | 5473 | 6 | .. | 74700 | 71008 | 1410 | 491 | 264 |
| „ Russia .. .. | 124 | 20 | 144 | .. | 224012 | 206895 | .. | .. | .. | .. | 81 | .. | 21 |
| „ Spain .. .. | .. | .. | .. | .. | 39010 | 39275 | .. | .. | 179830 | 22120 | 208 | 101 | .. |
| „ Sweden .. .. | 52 | .. | 52 | .. | 4925 | 750 | .. | .. | 299 | 112 | 402 | .. | 195 |
| „ Turkey .. .. | .. | .. | .. | .. | 14905 | 7367 | .. | .. | .. | .. | . | .. | .. |
| „ India .. .. | 221 | .. | 221 | 1379 | 691732 | 636869 | 2 | 108340 | .. | .. | 51534 | 4644 | 834 |
| „ Australia .. .. | 4347 | 564 | 4911 | .. | 7855098 | 6867390 | 70 | .. | 9008 | 13048 | 1830 | 1983 | 3840 |
| „ America .. .. | 558 | .. | 558 | 108390 | 435390 | 272290 | 436 | 2187 | 80000 | .. | 37444 | 97949 | 118073 |
| „ Africa .. .. | .. | .. | .. | .. | 73966 | 83818 | .. | .. | .. | .. | 4 | 129 | 502 |
| „ China .. .. | 213 | .. | 213 | .. | 218652 | 189903 | .. | 200 | 57400 | .. | 4277 | 474 | .. |
| „ Singapore .. .. | 4 | .. | 4 | .. | 51709 | 23[illegible]72 | 405 | 209 | .. | .. | 29081 | 9410 | .. |
| „ Mauritius .. .. | 75 | 28 | 103 | .. | 91790 | 109703 | .. | .. | .. | .. | .. | .. | .. |
| „ Malta .. .. | .. | .. | .. | .. | 113050 | 59595 | .. | .. | .. | .. | .. | .. | .. |
| Total export from 1st Jan. to Sept. 21st 1896 | 17983 | 645 | 18628 | 881743 | 78236430 | | 25446 | 232359 | 1356298 | 553018 | 203381 | | 246310 |
| do 1895 | 54012 | 3707 | 57719 | 733288 | 73029658 | | 22755 | 259711 | 1440562 | 491048 | 234131 | | 196075 |
| do 1894 | 22696 | 538 | 23284 | 2181459 | 64253275 | | 16067 | 212102 | 1349213 | 380482 | 342527 | | 242732 |
| do 1893 | 44297 | 1891 | 46188 | 3029969 | 61249256 | | 24973 | 253202 | 1238294 | 393081 | 247367 | | 279298 |

## MARKET RATES FOR OLD AND NEW PRODUCTS.

*(From Lewis & Peat's Fortnightly Prices Current, London, September 9th, 1896.)*

| | QUALITY. | QUOTATIONS. |
|---|---|---|
| ALOES, Socotrine ... | Fair to fine dry ... | 44s a 100s |
| Zanzibar & Hepatic | Common to good .. | 11s a 76s |
| BEES' WAX, | | |
| Zanzibar & Bombay { White . | Good to fine ... | £7 a £8 |
| { Yellow... | Fair | £6 a £7 |
| Mauritius & Madagascar.. | Dark to good palish . | £6 5s a £6 15s |
| CAMPHOR, China .. | Fair average quality .. | 107s 6d a 110s |
| Japan .. | ,, nom... | 122s 6d a 125s |
| CARDAMOMS, Malabar.. | Clipped bold. bright fine | 1s 1d a 2s 8d |
| | Middling stalky & lean | 1s 5d a 1s 9d |
| Ceylon.—Mysore .. | Fair to fine plump .. | 1s 8d a 3s 7d |
| | Seeds .. | 2s 9d a 3s 11d |
| ,, Tellicherry.. | Good to fine .. | 1s 8d a 2s |
| | Brownish .. | 1s 3d a 1s 8d |
| ,, Long ... | Shelly to good ... | 1s 6d a 3s |
| ,, Mangalore . | Med brown to good bold | 2s 4d a 3s 6d |
| CASTOR OIL, Calcutta.. | 1sts and 2nds .. | 2⅛d a 3¾d |
| Madras | ... | 2⅛d |
| CHILLIES, Zanzibar .. | Dull to fine bright | 25s a 35s |
| CINCHONA BARK.— | | |
| Ceylon .. | Ledgeriana Chips | 1d a 3½d |
| | Crown, Renewed .. | 2d a 4½d |
| | Org. Stem | 1¼d a 3d |
| | Hybrid Root ... | 2½d a 2¾d |
| | Chip ... | 1¼d a 2d |
| CINNAMON, Ceylon 1sts | Ordinary to fine quill .. | 10½d a 1s 1d |
| 2nds | ,, ,, . | 9⅞d a 1s |
| 3rds | ,, ,, . | 9¼d a 11½d |
| 4ths and 5ths | Woody and hard | 8¾d a 9½d |
| Chips | Fair to good | 3d a 3¼d |
| CLOVES, Penang .. | Dull to fine bright bold | 7d a 11d |
| Amboyna .. | Dull to fine | 3d a 4d |
| Zanzibar } | Good and fine bright . | 2¼d a 2½d |
| and Pemba } | Common dull to fair .. | 1¾d a 2⅛d |
| Stems | Fair .. | ⅞d |
| COCULUS INDICUS .. | Fair .. | 7s 6d a 8s |
| COFFEE ... | | |
| Ceylon Plantation | Bold to fine bold colory | 110s a 118s |
| | Middling to fine mid | 103s a 108s |
| | Low mid. and low grown | 97s a 101s |
| | Smalls ... | 87s a 98s |
| Native .. | Good ordinary .. | 65s a 75s |
| Liberian .. | Small to bold .. | 70s a 80s |
| COCOA, Ceylon .. | Bold to fine bold ... | 68s a 73s |
| | Medium and fair ... | 55s a 62s |
| | Triage to ordinary ... | 22s a 50s |
| COLOMBO ROOT... .. | Fair to good .. | 12s a 17s |
| | Ord. & middling wormy | 9s a 11s |
| COIR ROPE, Ceylon .. | | nominal |
| Cochin .. | Ordinary to fair | £10 a £15 |
| FIBRE, Brush | Ord. to fine long straight | £10 a £24 |
| Cochin ... | Ordinary to good clean | £12 a £17 |
| Stuffing | Common to fine | £5 a £6 10s |
| COIR YARN, Ceylon .. | Common to superior | £12 a £26 10s |
| Cochin .. | .. .. very fine .. | £12 a £34 |
| do. | Roping, fair to good | £11 10s a £15 |
| CROTON SEEDS, sifted... | Fair to good | 60s a 66s |
| CUTCH ... ... | Fair to fine dry .. | 17s a 32s 6d |
| GINGER, Bengal, rough | Fair | 13s |
| Calicut, Cut A | Good to fine bold . | 52s 6d a 83s |
| B & C | Small and medium | 36s |
| Cochin Rough... | Common to fine bold | 28s a 32s |
| | Small and D's .. | 20s a 25s |
| Japan . | Unsplit ... | 15s 6d a 16s 6d |
| GUM AMMONIACUM .. | Sm. blocky to fine clean | 17s a 36s 6d |
| ANIMI, Zanzibar... | Picked fine pale in sorts | £10 7s 6d a £13 |
| | Part yellow and mixed | £7 17/6 a £10 10s |
| | Bean and Pea size ditto | 70s a £7 12/6 |
| | Amber and dk. red bold | £4 5s a £9 |
| | Med. & bold glassy sorts | 99s a 137s 6d |
| Madagascar ... | Fair to good palish | £4 8s a £6 15s |
| | ,, ,, red | £5 a £7 5s |
| ARABIC E.I. & Aden ... | Ordinary to good pale | 50s a 60s |
| Ghatti .. | Pickings to fine pale . | 25s a 6s |
| Kurrachee | Good and fine pale .. | 65s a 60s |
| | Reddish to pale selected | 35s a 45s |
| Madras .. | Dark to fine pale | 37s 6d a 45s |
| ASSAFŒTIDA .. | Clean fr. to gd. almonds | 40s a 70s |
| | Ord. stony and blocky | 15s a 35s |
| KINO | Fine bright .. | £20 a £25 |
| MYRRH, picked | Fair to fine pale .. | 80s a 90s |
| Aden sorts | Middling to good | 33s a 65s |
| OLIBANUM, drop | Good to fine white ... | 35s a 60s |
| | Middling to fair ... | 20s a 31s |
| pickings | Low to good pale ... | 7s a 15s |
| siftings | Slightly foul to fine ... | 9s 6d a 14s |
| INDIARUBBER, Assam | Good to fine ... | 1s 10d a 2s 3½d |
| | Common to foul & mxd. | 3d a 1s 6d |
| Rangoon | Fair to good clean ... | 1s 4d a 1s 11½d |
| Borneo ... | Common to fine .. | 1s a 1s 7d |

| | QUALITY. | QUOTATIONS. |
|---|---|---|
| INDIARUBBER, (Contd). | | |
| Java, Sing. & Penang | Foul to good clean .. | 1s 3d a 2s 3d |
| Mozambique { | Good to fine Ball | 2s 2d a 2s 5d |
| | Ordinary to fair Ball | 1s 2d a 2s 1½d |
| | Low sandy Ball | 10d a 1s 1d |
| | Sausage, fair to good | 1s 4d a 2s 5½d |
| | Liver and livery Ball | 1s 3½d a 2s 2½d |
| Madagascar { | Fr. to fine pinky & white | 1s 11½d a 2s 5d |
| | Fair to good black .. | 1s 3d a 1s 10d |
| | Niggers, low to good .. | 10½d a 1s 6½d |
| INDIGO, E.I. ... | Bengal— | |
| | Shipping mid to gd violet | 4s 6d a 5s 2d |
| | Consuming mid. to gd. | 3s 9d a 4s 4d |
| | Ordinary to mid. good | 2s 10d a 3s 8d |
| | Mid. to good Kurpah .. | 2s 6d a 3s 3d |
| | Low to ordinary | 1s a 1s 6d |
| | Mid. to good Madras | 1s 4d a 2s 10d |
| MACE, Bombay, & Penang | Pale reddish to fine . | 1s 7d a 2s 4d |
| | Ordinary to fair .. | 1s 2d a 1s 6d |
| | Chips and dark , | 1s |
| MYRABOLANES, Madras | Dark to fine pale UG | 2s 6d a 4s 6d |
| | Fair Coast | 4s |
| Bombay .. | Jubblepore .. | 3s 9d a 6s |
| | Bhimlies .. | 3s 9d a 7s |
| | Rhajpore &c. .. | 3s 6d a 5s 6d |
| Bengal .. | Calcutta . | 3s 6d a 5s 6d |
| NUTMEGS— | 64's to 57's . | 3s a 3s 2d |
| Bombay & Penang | 112's to 65's .. | 1s 1d a 2s 11d |
| | 160's to 130's . | 9d a 1s |
| NUTS, ARECA ... | Ordinary to fair fresh | 8s 6d a 12s 6d |
| NUX VOMICA, Bombay | Ordinary to middling | 4s 6d a 6s |
| Madras | Fair to good bold fresh | 6s a 7s 6d |
| | Small ordinary and fair | 4s 6d a 7s |
| OIL OF ANISEED ... | Fair merchantable .. | 8s |
| CASSIA .. | According to analysis | 4s 8d a 7s 6d |
| LEMONGRASS .. | Good flavour & colour . | 2¼d |
| NUTMEG .. | Dingy to white | 3½d a 4d |
| CINNAMON ... | Ordinary to fair sweet | 4d a 1s 3d |
| CITRONELLE ... | Bright & good flavour | 1s 2d a 1s 9d |
| ORCHELLA WEED— | | |
| Ceylon .. | Mid. to fine not woody | 11s a 15s |
| Zanzibar. .. | Picked clean flat leaf | 10s a 20s |
| | ,, wiry Mozambique | 15s a 17s 6d |
| PEPPER (Black)— | | |
| Alleppee & Tellicherry | Fair to bold heavy .. | 2¼d a 2½d |
| Singapore | Fair ... ... .. | 2 5-16d a 2⅜d |
| Acheen & W. C. Penang | Dull to fine | 2d a 2⅜d |
| PLUMBAGO, lump .. | Fair to fine bright bold | 15s a 17s 6d |
| | Middling to good small | 3s 6d a 13s |
| chips . | Dull to fine bright | 1s 6d a 8s 9d |
| dust ... | Ordinary to fine bright | 2s a 6s |
| SAFFLOWER ... | Good to fine pinky .. | 85s a 90s |
| | Middling to fair | 80s |
| | Inferior and pickings | 60s a 65s |
| SANDAL WOOD— | | |
| Bombay, Logs | Fair to fine flavour . | £30 a £50 |
| Chips | .. ... ... .. | 5s a £3 |
| Madras, Logs | Fair to good flavour .. | £30 a £50 |
| Chips | Inferior to fine | £4 a £8 |
| SAPAN WOOD, Bombay | Lean to good .. | £4 a £5 |
| Madras | Good average | £4 a £5 nom. |
| Manila | Rough & rooty to good | £4 10s a £5 15s |
| Siam | bold smooth | £6 a £7 |
| SEEDLAC .. | Ord. dusty to gd. soluble | 70s a 95s |
| SENNA, Tinnevelly .. | Good to fine bold green | 6d a 8d |
| | Fair middling medium | 2½d a 5½d |
| | Common dark and small | ½d a 2d |
| SHELLS, M. o'PEARL— | | |
| Bombay .. | Bold and A's ... | £4 15s a £5 2s 6d |
| | B's and B's ... .. | £4 10s a £4 15s 6 |
| | Small ... .. .. | 85s a 90s |
| Mussel .. | Small to bold .. | 10s a 50s |
| TAMARINDS, Calcutta | Mid. to fine bl'k not stony | 9s |
| Madras ... | Stony and inferior .. | 6s a 7s |
| TORTOISESHELL— | Selected .. .. | 54s |
| Zanzibar and Bombay | Small to bold dark ... | |
| | mottle part heavy .. | 19s 6d a 24s 6d |
| TURMERIC, Bengal . | Fair . | 7s 6d |
| Madras . | Finger fair to fine bold | 8s a 9s 6d |
| Do. | Mixed midlng. [bright | 7s a 8s |
| Do. | Bulbs .. .. .. | 6s 6d a 7s 6d |
| Cochin .. | Finger .. .. .. | 6s 6d a 7s 6d |
| | Bulbs ... .. .. | 5s 6d a 7s 6d |
| VANILLOES— | | |
| Mauritius and } 1sts | Gd. crystallized 4 a 9 in. | 17s a 32s |
| Bourbon } 2nds | Foxy & reddish 4½ a 8 ,, | 11s a 15s |
| 3rds | Lean and inferior .. | 7s a 10s |
| Seychelles ... | Inferior to fine crystallized 3½ a 9 in. | 8s a 31s |
| VERMILION ... | Fine, pure, bright ... | 2s 8d a 2s [illegible]d |

THE

# AGRICULTURAL MAGAZINE,

## COLOMBO.

*Added as a Supplement Monthly to the "TROPICAL AGRICULTURIST."*

The following pages include the Contents of the *Agricultural Magazine* for October :—

Vol. VIII.] OCTOBER, 1896. [No. 4.

### SEASON NOTES.

W*ESTERN PROVINCE*—Yala paddy crop ripenings and harvesting has commenced. Fruit and vegetable are reported to be scarce in the Kalutara and Negombo districts. *Central Province.*—Yala crops are ripening and are being harvested and in some places fields being sown for Maha.

*Stock.*—Foot and mouth disease is reported from Udahewaheta in the Nuwara Eliya district.

*Northern Province.*—Work in paddy fields retarded by want of rain. Outturn of dry grain unsatisfactory owing to the drought—tobacco fields continue low.

*Southern Province.*—Yala crops reaped and the yield middling except in the Hinidum Pattu when it is poor owing to unseasonable weather. Fruit and vegetables reported scarce in the Galle and Hambantota districts.

*Eastern Province.*—Crops being harvested, other in ear, results satisfactory.

*Stock.*—Foot and mouth disease is reported from Batticaloa.

*North-Central Province.*—Yala crops have been reaped with satisfactory results.

*Stock.*—Foot and mouth disease in all palatas, cattle plague in all palatas except Tamankaduwa.

*Sabaragamuwa Province.*—Yala crop being harvested, prospects fairly good, and ploughing and sowing for the Maha proceeding.

### RAINFALL TAKEN AT THE SCHOOL OF AGRICULTURE DURING THE MONTH OF SEPTEMBER, 1896.

| | | | | | |
|---|---|---|---|---|---|
| 1 | Tuesday .. | Nil | 19 | Saturday .. | ·52 |
| 2 | Wednesday .. | Nil | 20 | Sunday .. | ·18 |
| 3 | Thursday .. | Nil | 21 | Monday .. | ·42 |
| 4 | Friday .. | ·04 | 22 | Tuesday .. | 1·02 |
| 5 | Saturday .. | Nil | 23 | Wednesday .. | ·37 |
| 6 | Sunday .. | Nil | 24 | Thursday .. | ·20 |
| 7 | Monday .. | ·56 | 25 | Friday .. | ·01 |
| 8 | Tuesday .. | ·10 | 26 | Saturday .. | ·78 |
| 9 | Wednesday .. | 2·20 | 27 | Sunday .. | Nil |
| 10 | Thursday .. | ·31 | 28 | Monday .. | ·04 |
| 11 | Friday .. | ·03 | 29 | Tuesday .. | ·14 |
| 12 | Saturday .. | ·10 | 30 | Wednesday .. | ·26 |
| 13 | Sunday .. | ·44 | | | |
| 14 | Monday .. | Nil | Oct. 1 | Thursday .. | 3·02 |
| 15 | Tuesday .. | ·05 | | | |
| 16 | Wednesday .. | Nil | | Total .. | 11·12 |
| 17 | Thursday .. | Nil | | Mean .. | ·37 |
| 18 | Friday .. | ·33 | | | |

Greatest amount of rainfall in any hruos—on the 1st of October, 3·02 inches.

Recorded by M. W. K. BANDARA.

### A SUPPLY OF SEEDS AND PLANTS FOR NATIVE CULTIVATORS.

If it is asked how the Government through the Agricultural Branch of the Department of Public Instruction could best help the native cultivator, we would be inclined to say that it is by giving him facilities for procuring seeds and plants. What are the means at present available to him for securing these? Practically none. There is in fact no place within easy reach of the cultivator where the most ordinary seeds and plants which yield food products could be procured. Seeds of grain crops and seeds and plants of fruit trees are what the cultivator may be said to be most in need

of Now, without going beyond Ceylon, we believe that if the cultivator in one district or province found a ready means for obtaining seeds and plants from another district or province he will thereby materially benefit himself. It is well-known that in certain remote districts where the food supply is deficient, jak and breadfruit are practically unknown as articles of diet, though the trees producing these fruits should thrive well in such places. We remember hearing some time ago that a revenue officer, who is well-known for the interest he takes in the welfare of the poorer village population, went the length of offering rewards to those who planted these trees in their gardens.

We should imagine that a workable scheme for supplying the want which we have indicated above, could be formulated in connection with the work of the Colombo School of Agriculture. This institution might be made a sort of central depôt where different kinds of seeds and plants of food-yielding trees--both indigenous and introduced species and varieties—could be procured by would-be growers. Nurseries and seedstores for keeping up a supply of such plants and seeds as would be specially suitable for cultivation by the natives, would, of course, have to be established, and to this end the school will need to be properly equipped and furnished with the necessary funds. The benefits of exchange of seed paddy are two well-known to be stated here, and yet the practice is but little adopted by paddy cultivators in the island. In this connection we may refer to the successful experiments that were carried out some years ago by Mr. William Jansz of Galle, and which conclusively proved that better crops could be obtained by sowing "fresh" seed.

There are also many foreign varieties of paddy, unknown in Ceylon, which can with advantage be introduced into the island. The introduction of the variety known as Carolina paddy many years ago was admitted as a distinct gain to paddy cultivation in Ceylon. We believe that the agricultural society (now alas defunct) which flourished in the forties, did good work by introducing new forms of economic vegetation into the island.

If such a scheme as we have suggested is adopted, and a central depôt be established at the Colombo School of Agriculture where seeds and plants could be offered on easy terms to intending cultivators—who at present know not how or where to obtain them—a great advance will have been made in the improvement of grain cultivation and the encouragement of fruit culture in the island.

## OCCASIONAL NOTES.

We have received more than one application for the locally manufactured type of plough referred to in our last issue, and at present six ploughs are being made to order. One of these locally-made implements is now being used on the Havelock Racecourse, and is doing its work well.

The small crop of grapes from the vineyard attached to the School of Agriculture was taken in early in September, the bunches numbering about 250. Those who had an opportunity of tasting the fruit passed a favourable opinion on the quality of the grapes. It is to be hoped that the experiment in viticulture will be continued till the vines reach the "full-bearing" period, when a final decision as to the prospects of the "extensive" cultivation of foreign grapes in Ceylon may arrived at.

The Government Agricultural Instructorships were suppressed at the end of August. It is to be hoped, however, that the vote for maintaining these posts will not lapse, for if the scheme initiated by Mr. H. W. Green—the well-intentioned and zealous promoter of agricultural education in Ceylon—has been found to be barren of results, there is all the more reason that a more practical scheme should be formulated for the improvement of native agriculture, to take the place of that which has been withdrawn. An initial failure does not justify the complete abandonment of a good cause, but as the old rhyme teaches us, demands a second and third trials.

We would direct the attention of our readers to the first of Mr. Zanetti's paper on "The Fruit Tree" which appears in the present issue—We have no doubt that all fruit-growers will join us in offering our thanks to the writer for placing his practical and useful knowledge at our disposal. We may mention that we have already had many applications for the past numbers of the magazine which contained Mr. Zanetti's remarks on "Pruning,"—a proof of the usefulness of his contributions.

Mr. W. A. de Silva, late headmaster of the School of Agriculture, and a qualified Veterinary Surgeon, has severed his connection with the school and accepted service under the Municipal Council of Colombo. As an Inspector of Cattle, Meat, and Milk, &c., Mr. de Silva should find ample scope for his veterinary attainments, and duties congenial to his tastes. Mr. Hoole, late 2nd assistant teacher, the second old boy of the school who has qualified as a Veterinary Surgeon, has been appointed an assistant to the Colonial Veterinary Surgeon and stationed at Anuradhapura. The school is therefore the poorer by the loss of two teachers whose places on the staff it will not be easy to fill.

The first sessional examination of forestry students was held about the middle of August, the subjects in which they were examined being Sylviculture, Morphological Botany, Mathematics (Euclid, Algebra, Trigonometry and Arithmetic), Forest Law and Surveying.

Applications for rhea cuttings from the school still continue to come in, so that before long we shall probably be in a position to arrive at a decision as to the prospects of remunerative cultivation of this much valued fibre-plant in Ceylon.

## THE FOREST LAWS OF CEYLON.

*(Continued).*

The chief objects of the Ordinance No. 10 of 1885 would be best explained by a few extracts from Mr. Vincent's Report. In his introductory chapter on the future management and working of Forest administration, Mr. Vincent points out the evil effects of not protecting our forests. He says: "Where there is no effective forest conser-

vancy, increasing population soon finds that there are no forests to supply its wants, or that there is no soil suitable for the extension of cultivation. The latter may be said already to be the case in Ceylon, for I may say with absolute correctness, that unless the reserves at over 5,000 feet elevation are encroached on, there is no forest land between 2,000 and 5,000 feet left for capital to open out. And why? Because chena clearings have swallowed up all the forests which were not in times past required for immediate sale. It is not that all the forest has been cleared for coffee, and that thus the enterprise has found its own limits, but large though the extent of coffee estates is, the map shows that immense areas, now only covered with lantana, would be available for fresh development of the enterprise had any foresight or care been shown in preventing forest destruction. It is not a mere matter of opinion, but one that is repeatedly confirmed by officials and official documents, that, owing to the apathy of Government, various claims, such as those put forward under tombu register extracts or under old Sannas: also to rights of paddy land appurtenances, to communal rights, to proprietary and occupancy rights under Ordinance No. 12 of 1840 &c, have been allowed to exist unrecorded and undefined. Under colour of these claims, people have been permitted unquestioned to devastate vast areas of the finest forest, not only in the Central Province, but throughout the moist zone. In some places, I am informed, the forest cleared has been land that Europeans had applied for, and which was about to be surveyed for sale. Having a detailed survey of the Central Province we can estimate accurately what small areas of forests are left uncleared, and what large ones are only covered with scrub. Areas of forest are still left in the moist zone, but when we come to select our reserves for the small local consumption of softwoods and fuel, we shall find that little is available in suitable situations, those forests best situated having been sold or cleared, and that to secure the small quantity of fuel required for our railway, artificial plantations have to be made." The chena cultivation question has been the subfect of constant complaint and has been dealt with by almost every Governor since the time of Sir Henry Ward. The question is one of considerable difficulty. One of the main objects of the Ordinance was to introduce a system which has been found to work well in similar circumstances in British Burmah.

The position of the Crown in regard to forests is also explained by Mr. Vincent, and it would be as well to quote his very wsdrds on this subject "The position of the state," says Mr. Vincent, with regard to its forests and waste lands is often misunderstood, and the Crown is too frequently regarded as a private landholder, instead of as a trustee with a large and valuable public property which it has to manage for the general good, and to protect against the innumerable forms of trespass to which state forest property is everywhere exposed. Such has certainly been the mistaken position assumed in administering the forest law of Ceylon and although the legislature may give extensive, protective powers, judicial decisions have usually thrown all the advantage on to the other side. In endeavouring to punish forest offences, the courts have regarded the Crown not as a trustee for the whole nation, but as a landholder whose endeavours to protect an unjust monopoly ought to be thwarted in every way. The real object of the state is to administer its ational trust to the best possible advantage, to orm State Forest Domains for the permanent public benefit, protecting the public property against individual trespass. We wish to form reserves of timber and fuel, at the same time protecting the property of the nation and improving it. The Legislature has, not only in the Timber Ordinance, but in almost every other law, put large powers into the hands of the Executive Government, which it is trusted to exercise with due discretion. The state has a powerful monopoly, which, if not carefully administered and protected, may, as has already to a great extent happened in Ceylon, be gradually broken up and infringed on, so as to be of comparatively small value. General public interests then suffer to benefit only a few individuals, who take advantage of the incomplete state of the law, and the ill-defined rights which it confers. The forest question can only receive proper treatment when regarded from the standpoint of a large national property, handed to us by the past generation, and which we are also bound to maintain in unimpaired productiveness for the benefit of the present and future generations." To give effect to this view was the present ordinance specially designed.

*(To be continued.)*

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## THE FRUIT TREE.

Fruit plants may be said to be composed of four principal parts: roots, stem, leaves and flowers. Plants originate from seeds, which germinate when put into the ground, under the influence of air, heat and moisture, giving rise to two organs: one of these, the root, has an inclination to avoid the light and bury itself in the soil, while the other, the stem, on the contrary, seeks the light and grows above the surface of the ground.

The tap root which is formed by the germination of the seed, grows in most cases vertically into the soil: it carries numerous branches, which after lenghtening, become thick and woody in the second year and spread themselves in the soil laterally as well as vertically. On these branches will be found the minute root—hairs which have the powers of absorbing the nourishing matter in the soil.

The important functions of the roots being recognised, it is evident that in the cultivation of fruit trees, we must be careful to favour their development, and this is done by preparing for them a very free and well fertilized soil. Generally the growth of the roots is in proportion to that of the stem. We may conclude from this, that the more numerous are the roots, the more branches the stem will carry, and *viceversa*.

The stem is the support of the leaves and all other aerial organs of the plant. It is so to speak a communicating channel, through which the substances absórbed by the roots reach the leaves, and the organic food elaborated by the leaves is distributed through the entire system of the plant.—At a certain height the stem will produce

branches which again subdivide to form primary and secondary branches.

·The leaves appear on the stem and its ramifications; and through them respiration and the absorption of gases from the air is carried on. Buds are formed in the angles of leaf and stem or branch, and in some cases at the end of shoots. These buds contains rudiments of new shoots or new flowers. Those of shoots are thin and pointed, (called by the fruit culturist buds for wood); buds containing flowers (buds for fruit) are thicker and of a roundish appearance.—Fruit growers make use of buds as reproducers of varieties by inserting them on plants grown from seeds.—While the leaves of the plant absorb the gases and moisture contained in the atmosphere, the roots take in water and dissolved food substances from the soil which are necessary to vegetation. This disolved food absorbed by the roots, ascends by the stem up to the leaves. Once arrived at the leaves and in contact with the gases absorbed by them, and under the influence of heat and particularly of light, it undergoes a sensible change, becoming more concentrated and acquiring new properties. In this form it descends from the leaves and becomes distributed throughout the plant. This liquid is the one which essentially helps in the nourishment and development of plants or trees.

Fruit trees are propagatedby seed or by division. The propagation by seed is the natnral course by which all plants can be propagated, but through this means we will only obtain plants true to the species, though not necessarily true to the variety, since when seed-grown they are subject to certain modifications of character. As an example a mango tree grown simply by seed, may not turn out in wood, leaves, flowers and fruit, identical in character with the tree from which the seed was obtained. Propagation by division is an artificial course adopted by man. Its object and result is to exactly reproduce the characters of the variety in all its parts. This mode of propagation is carried on by means of cuttings, by under layers, or by the method of budding and grafting. From the facts above mentioned it is evident that the fruit-grower will depend on the seed only to reproduce good healthy subjects on which to graft the variety he intends to cultivate.

(*To be continued.*)

## THE INSPECTION OF MEAT.

By G. W. Sturgess, M.R.C.V.S., &c., Government Veterinary Surgeon.

III.

*Abnormal Appearance of Flesh.—(continued.)*

*Yellow Flesh.*—Is generally seen as the result of Jaundice.

*Dark or Magenta Coloured Flesh.*—A very dark appearance of the flesh is usually indicative of some grave blood disease, and it becomes more marked after exposure to air for a short time. It is also seen when animals have died from strangulation or suffocation, or severe forms of fever. It should be classed as unmarketable.

*Green Flesh.*—Is indicative, in most cases, of putrefaction or mortification and almost always associated with a bad odour. Occasionally the stomach is lacerated by the butcher when being removed and the contents escape and stain the surrounding tissues green—the trick of stripping being then practised to remove it.

*Odours.* Particular kinds of food impart an odour to the flesh. Too liberal feeding with turnips gives to the flesh a peculiar smell—also in cases where the animal has been choked by a turnip the odour is especially pronounced. Medicines such as turpentine or ether give an odour to the flesh. The odour of urine is given to the meat in cases of urine poisoning. Meat may contact unpleasant odours from some bad smelling matter or gas being present in or near to the slaughter-house especially those odours arising from the close proximity of closets, cesspools or latrines.

*Effects of Cold upon Flesh.*—Frozen flesh has a damp, cold feel and is generally stained a light pink colour due to the effect upon the colouring matter of the blood, and muscles. Frozen meat should be carefully examined and the carcase or joints deeply cut into, because unless a carcase has become quite cold at the time of freezing, the outside becomes frozen and the interior does not, consequently it soon putrefies and is worthless. Frozen mutton is generally admitted to be preferable to frozen beef—in the former case the carcase is frozen whole while the carcase of beef is cut into a number of parts thus losing more of its nutritive qualities.

## SERICULTURE.

The Muga silkworm, *Antheræa ssama*, is a wild form next in commercial importance to the Tusser. The insect is met with chiefly in Assam, but is also found in North Burma. It is to a certain extent domesticated in Assam, as it is often reared in houses; but the best cocoons are obtained only from those that are allowed to form on the trees.

The Muga is a multivoltine worm producing five broods a year. The full grown worm is nearly five inches in length and is as thick as the forefinger. It is of a green colour, the under part being of a darker shade; while the back is of a lighter green. The body is composed of ten rings each with four hairy red moles; a brown and yellow stripe extends midway down each side from the tail to within two rings of the head and below it the breathing holes are marked by a row of seven black points; the head and claws are light brown and the holders dark green with black prickles. When in a wild state and feeding on the trunk of a tree, the worms often descend by the branch when they have exhausted the supply of leaves on one tree and resort to another. They always prefer young trees, apparently because old trees are often infested by ants. They feed from eight o'clock in the morning till near noon and from three till sunset. A complete cycle of the Muga worm lasts for about 54 days in warm months and 81 days in the cold season.

| | | | | |
|---|---|---|---|---|
| Hatching .. | 7 | ... | 10 | days. |
| Worm .. | 26 | .. | 40 | „ |
| Spinning Cocoon | 4 | .. | 7 | „ |
| In the Cocoon | 14 | .. | 21 | „ |
| As a Moth | 3 | .. | 3 | „ |

The cocoon of the Muga is large and thin, and fawn coloured: it is about $1\frac{3}{4}$ inches long and one inch in diameter.

The export of Muga silk from India is principally in the form of *thread* which are sent to the Persian Gulf.

Dr. Watt in his Dictionary gives the following as the food plants of the Muga worm on the authority of Sir. D. Brandis :—

1 Cinnamomum Obtusifolium
2 Cylicopodaphne nitida.
3 Michelia Champaca Sinhalese, Sapu.
4 Machilus Odoratissima.
5 Symplocos Paudiflora.
6 Litsœa Citrata.
7 L. Polyantha.
8 L. Salicifolia.

W. A. D. S.

## BEE-HIVES.

Albert Gale, a well-known writer on Apiculture, has devoted a series of articles to this subject, which have appeared on the Agricultural Gazette of New South Wales. For much of the information given below we are indebted to this authority, who states that he has wrritten with the object of giving instruction not to professional bee-keepers but to beginners, particularly to those in remote place where carriage and other concomitant troubles one always standing in the way of the enthusiastic amateur. Orginally bees, like the wild bees of the present day, constructed their combs among rocks and caves and such like places where natural shelter was afforded them. The development of artificial homes for bees was very slow. Those used in Egypt even now, are sundried earthen tubes, about 4 feet long. The same style of hive is said to be the one adopted by the Japanese and the hill tribes of North India. From these sundried clay pots to the old fashioned straw hive development was very slow. For obtaining the honey both from the clay pots and the straw hive "fire and brim stone" were the persuasive arguments used to induce the little busy bee to yield up its laboriously—gathered stores to satisfy the cravings of the bee-keeper. For long this barbarous system, which is in vague even at the present day in Ceylon, continued to be practised till some humane individual came to the conclusion that something might be done to save the valuable lives of the inmates of the hive. It was Nutt who invented the straw super which was improved upon by 'Neighbours,' Pettitt's and Taylor's bell-glass supers. About 1864, *The Times* (London) Bee-master strongly recommended "Pettitt's Hexagonal" as improved by himself, and by the introduction of 6 slides for the purpose of communication between the broodchamber over the super. But later on he discarded it for the Ayrshire Box-hive. Pettitt's "Temple-hive" with its 4 bell-glasses from which the drones were effectually excluded, seems to have been one of the first wooden structures for bee-keeping having any pretensions to use and ornament used in England.

In 1848 the Rev. Mr. Drieron, published his Theory and Practice of Bee-culture, in which he described his method of removing the combs without their being entirely destroyed. His method was by a moveable top-bar to which the bees attached the comb, and also attached it to the sides of the hive from where it had to be removed by the application of the knife. This was the germ from which sprang the moveable bar-frames.

The Rev. L. L. Langstroth, constructed a hive on the plan of the folding hives used by the celebrated Huber for the purpose of verifying some of his (Huber's) valuable discoveries. The use of the Huber hive had convinced Langstroth that a hive could that should give the bee-keeper a complete control of the combs without enraging the bees. The cutting of the combs from their attachment to the sides and bottom of the hive was the great drawback in Drierron's invention, and Drierrons' moveable *top-bar* speedily gave place to Langstrotth's moveable *frame.*

The various forms of hives now in use are all more or less modifications of the Langstroth. Whatever the pattern, model, or size the material most suitable is soft, porous, light wood. The wood should be well-seasoned so that there may be no hoisting or shrinking with atmospheric changes. Among other hives besides the Langstroth or Langstroth Simplicity, are the Gallup, Heddon, Quinby, Berlepch, Long-Idea &c, as modifications thereof.

The Heddon hives, though of most approved Structure, are only suitable for very experienced bee-keepers. It requires a skilled mechanic to make them, and they are far more difficult in manipulating than the Langstroth.

The Langstroth hive has stood the best of nearly half a century and it is the most generally used.

Prof. Cook has said of it, "It left the hands of the great master in so perfect a form that even the details remain unchanged by many of our first bee-keepers."

Anyone, says Mr. Gale, who has a fair amount of skill with tools can make a Langstrott hive. The following hints are given to guide the amateur bee-keeper in constructing his own hive after the Langstrott type:—

The wood used should be soft, light and well-seasoned, and the only thing that is imperative in the construction is that the measurements must be rigidly adhered to, otherwise there will be no end of trouble in the manipulating of the bees. Many a beekeeper who has been his own carpenter has given up beekeeping in disgust, because, in the construction of the home-made hives, there has been a want of care in giving bee-space—quarter of an inch—truebee space is $\frac{3}{16}$ inch.

The wood in kerosine and other packing cases is more or less suitable. For the colder districts the sides of the first named are too thin. The smell of kerosine is quickly evaporated by placing the cares in the full glare of the sun. The most suitable thickness is one inch or a little less if no planing is to be done. The ends must always be of inch wood or of sufficient thickness to admit of a rebate (rabbet) for the moveable frames to hang freely. The ends of kerosine cases, though not an inch thick, answers very well for the purpose.

The brood chamber or body of the hive is $9\frac{1}{2}$ in deep if a moveable bottom is used, but if the bottom be a fixture (though a moveable bottom is always preferred) it should be 10 in deep. For an eight-framed hive the ends must be $14\frac{1}{4}$ in—

that is if the sides are to be nailed to the ends—but if the ends are to be nailed to the sides an allowance must be made for the thickness of the sides. The sides must be 20 in outside measurement. Therefore a piece of timber 6 ft × 10 in is sufficient to make a brood chamber or a full size super. From such a piece of timber, first cut off $28\frac{1}{2}$ in (if the sides are to be nailed to the ends, and it is always better so to do) and work a rebate (sabbet) $\frac{3}{8}$ in plus the thickness of the top bar of the moveable frame, and the top bar of such a frame should be at least $\frac{1}{2}$ in thick, afterwards cutting into two equal parts. Each one will thus be $14\frac{1}{2}$ × 10 in.

An easier and simpler way of making the rebate, although not so workmanlike, is to plant a strip along the end piece of the frame and fasten it with fine nails.

A full-sized super is the same measurement as the brood chamber. It will be noticed that if a moveable bottom board be used the depth of the bar-frame will be $9\frac{1}{4}$ in, thus coming flush with the base of the end piece of the frame, and showing no bee-space—a cleat to form the bee-space is fastened on the bottom board. Half-sized supers for shallow frames are the same measurements in all except in depth.

Since the above was written we have had an opportunity of conferring with a gentleman who has had much experience in bee-keeping, and carried on apiculture in Ceylon with much success. He places great importance on the structure of the hive best suited for Ceylon bees, and though the hives adopted by him were constructed after the modern type of frame hives there are some important alterations which have been made to suit local conditions. This gentleman is having a hive built for us according to his own plan, and we hope to be able to induce him to describe its construction, and, if possible, also to detail his experience in bee-keeping, in a future issue.

## MILK AND MILK PRODUCTS.

(By Mr. James Mollison),

*Superintendent, Government Farms, Bombay.*

The food given to milch cattle influences the quality of the milk to a considerable extent. Succulent food undoubtedly causes increased secretion, but at the same time it lowers the percentage of total solids. The morning's milk is usually not so concentrated as the evening's milk, but on the other hand the morning yield is greater. It is not clear why this increased yield should be associated with a diminution in the percentage of solids, unless we presume that the longer period which generally elapses, between the evening and morning milking permits of fuller and freer secretion than the shorter interval between morning and evening. The observations taken at the Poona Government Farm show about one per cent difference of total solids in favour of the evening's milk which, is however, more than counterbalanced by the increased yield in the morning.

The butter fat exists in milk as butter globules of various sizes easily discernible under the microscope. The butter globules are of lower specific gravity than the other constituents of milk. Consequently if the milk is set in a vessel, the butter fat rises to the surface to form cream which can be separated by skimming. In the milk the casein also exists in suspension in minute globules. In fresh milk the casein neither tends to rise nor sink because it has absorbed part of the water of milk and is thereby softened and swollen, so that it is more evenly diffused through the water of milk. The sugar of milk is in solution; the mineral matter is partly in solution and partly held in suspension. It consists mostly of phosphates and common salt. The ash constituents are oxides of iron and alumina, magnesia, potash, soda, lime and phosphoric acid.

Milk rapidly undergoes change, particularly if the day temperature is high. The changes are induced by bacterial ferments which thrive in the milk because it is almost a perfect food. The most common change which occurs in the souring of milk is brought about by the conversion of sugar of milk (lactose) into lactic acid. The curdling of milk is an accompaniment of the lactic fermentation. This curdling can be accomplished artificially by means of an organic or mineral acid, or, as in cheesemaking, by precipitating the casein by the use of rennet. The active principle in rennet is the digestive agent found in the fourth stomach of a calf. It not only curdles the casein but also induces other changes which lactic acid cannot induce. The change of lactose into lactic acid is merely a molecular one and is due to growth of the *bacterium lactis*, an organism plentiful in the air of a dairy but particularly where a dairy is not kept scrupulously clean. Immediately milk is drawn from the udder it is subject to contamination. The chemical changes which then take place are directly caused by ferments induced by contamination. The temperature of the milk as it is drawn from the udder is just the temperature at which the reproduction of microbes takes place most rapidly.

If milk is cooled immediately bacterial growth is checked and will not again become active until the milk slowly warms, which it will do if the temperature of the dairy is higher than that of cooled milk. If the temperature is high, the milk will not keep long; if it is low the milk will remain sweet a considerable period. Milk which has been boiled and then rapidly cooled and afterwards kept in a cool clean place will keep longer than milk not so heated; but if the surroundings of the dairy are unsanitary, and the dairy is within range of any unwholesome smell or other unhealthy influence, the milk is bound to become tainted in a manner which probably will make it dangerous for human food. Milk sours quickly in India during the hot season and also during the first part of the monsoon. During the early rains the atmosphere is close and sultry, and though the heat is not exceptionally oppressive, there is "thunder in the air," and any atmospheric electrical disturbance has a material effect in causing milk to sour quickly.

Milk as it is secreted may be contaminated by deleterious substances in the food; morover a diseased cow may yield milk which may be impregnated with disease germs and may therefore be the means of causing contagion, but as it leaves the udder it contains no fermentative bacetria. A few hours after milking the number of bacterial germs found in a cubic inch of milk is almost incredible, particularly if the temperature favours

reproduction. The bacteria which cause fermentative changes in milk can be destroyed or at least their development and activity can be stayed in many ways.

Boracic acid, carbonate of soda and saltpetre are all used as milk preservatives, the first being the most effective. These agents do not destroy fermentative organisms, but only check their development.

If the udders of the cows and the hand of the milker are clean, if the milk vessels have been thoroughly washed and well scalded, if the cows are milked in a pure atmosphere and if the udders are not inflamed or otherwise diseased, it is clear that the danger of organisms entering the milk is minimized.

But fermentative bacteria always exist in the air and it is practically impossible to prevent milk coming in contact with them; therefore other precautions to prevent fermentative changes are necessary.

Heat will kill all organisms in milk. If the heat applied is high enough, milk will be sterilized. Boiling will kill all bacteria. If boiled milk is kept out of contact with the air it will keep indefinitely. Preserved or condensed milk is prepared by evaporating milk to which sugar has been added until the mixture acquires the consistence of syrup. Whilst hot it is hermetically sealed in tins and keeps good for years. A high temperature kills the ferments of milk, a low temperature interrupts their activity if it does not actually destroy them. Milk, kept frozen, will keep good for months, whilst a mean temperature of 35° to 40° F. is sufficiently low to keep it good for days. A maximum day temperature of 55° F. will enable milk to be kept good sufficiently long to allow all the fat globules to rise to the surface. Whilst if the mean day temperature is 70° F. or higher the lactic ferment is so active, that lactic acid is formed in sufficient quantity to curdle the casein in a very short time, and the curdling entangles the butter fat globules so that they cannot rise to the surface.

## "NITRAGIN," OR THE USE OF PURE CULTIVATION OF BACTERIA FOR LEGUMINOUS CROPS.

Hellriegell's celebrated experiments have already been referred to. Briefly to recapitulate these: in the course of his experiments, Hellriegell found that the assimilation of the free nitrogen of the atmosphere was concurrent with the development on the roots of certain leguminous plants—of nodules which were subsequently found to contain specific micro-organisms or Bacteria; but that when these were absent, growth of the plant was stunted, and assimilation of free nitrogen did not take place. Further, that development—of the nodules could, speaking generally, be induced in sterilised sand supplied with purely mineral food, but containing no nitrogen, provided there were then added to it the watery extract from a fertile soil: but that in the case of certain plants, *e. g.* lupins, the extract from an ordinary fertile soil did not suffice, though that of a soil in which the particular crop experimented on had been previously growing well was effectual in producing development of the nodules on the roots.

Working on the lines thus enunciated by Hellriegel, Nobbe carried the inquiry a step further, and he reasoned from the observations made, more particularly in the case of lupins, that it was very probable that each plant possessed its particular kind of nodule, or, rather, that the nodules of particular plants contained bacteria peculiar to themselves, and that hence what was necessary was to seek to ensure for the plant grown the presence of the particular organisms that favoured the assimiliation by it of the free nitrogen contained in the atmosphere.

Nobbe accordingly started from the other side of the question, and taking the nodules which he found on particular leguminous plants, he set to work to eliminate the specific organisms and to obtain them in a pure state. It had been known, as I have already pointed out, that the growth of certain leguminous plants like lupins, which would not thrive on ordinary fertile soils, could be induced by mixing with the soil other soil from where lupins, for example had been growing well.

But it was also known to Nobbe that this transference of soil, besides being costly and inconvenient, had disadvantages connected with it, for not only were the specific organisms that might be favourable present, but there might be others that were distinctly unfavourable or destructive; while fungoid diseases, parasitic growths, and other elements of a nature prejudicial to the development of the plant might also be simultaneously imported. He sought, therefore, to avoid this by obtaining, *in the pure state*, the specific organisms which was believed to act favourably in the case of each leguminous crop, and apart from the disadvantages that might attend the presence of unfavourable elements.

The method adopted by Nobbe and Hiltner was that known as "pure cultivation." The contents of the particular plants were used for inoculating, in the usual way, a plate of specially prepared gelatine, and the organisms were cultivated on it. A second plate was inoculated from one of the colonies so formed, and the organisms again cultivated. This was repeated successively until, finally, a "pure cultivation" was obtained of the organisms believed to be the one peculiar to the particular plant, and the one by means of which nodules were formed and the plant was enabled to assimilate the free nitrogen of the atmosphere.

On examining microscopically the organisms obtained from the nodules of different leguminous plants, Nobbe could not, however, discover any external appearances which specially characterized one or the other, or which distinguished one from another.

Indeed, up to the present, it has not been possible to say, as the result of microscopial examination, that a particular organism is the one particular to peas, to clover, to luccrue or to any leguminous plant. Still, seeing it was known that in order to get lupins to grown, inoculation with a soil on which lupins had thriven was necessary, but that inoculation with soil where peas, for instance, had grown, was not effectual, Nobbe was led to conclude that, though there might be no external differences in the

appearances of the organisms of the two plants, yet the organisms might have undergone some alterations during the symbiosis with the particular plant, which rendered its action different in each case. He therefore pursued the investigation further in this direction.

## CORRESPONDENCE.

Sir,—Mr. W. Nock's remarks on this subject, are very welcome, and at our next opportunity will follow his advise and watch results. I believe the number of bunches on the vines in this last crop, was not such as to fear it affecting the future of the plants; I have seen so many good results from thinning of fruit in general, to neglect the operation or doubt of its usefulness. If it has been proved that doing so will improve the remaining fruit, not only in flavour (especially where saccharine matters are concerned) but also in appearence and still further hasten the maturing of the fruit, this is not, I believe, exactly wanted here, where grapes takes uery little more than half the time to mature than it takes in other countries and I must say to great disadvantage of flavour. I have not seen any thinning of the berries in the Continent, nor in Australia, probably I have not seen enough, as there is plenty to see and learn in this cultivation. In countries, where vine growing is done generally on a large scale this could not be attempted. In England where hot-houses and other artificial aids are applied for this cultivation, it is I am aware the practice, and I am quite persuaded that if carefully done by a very light and steady hand, it would benefit the remaining berries. Amateurs or prize fruit growers, should certainly do it for the sake of fine specimen on a small scale, but I dont think the operation as described by Mr. Nock, could be done when vines are grown for market purposes and as a condition *sine qua non.*

Referring to those perfect grapes seen by you in the fruit shops of London, they might not have undergone this thinning process, but more likely owed their lovely appearance to nature, the variety they belonged to and the soil that nursed them.

The Golden Chasellas, that gave us that little fruit this time, is one of the very few varieties allowed to pass as table grapes, having small berries in compact bunches ; almost all the others, and the best (every Muscat, Ladies-finger, Gross Colman, etc.) have large bunches with large berries well distributed and ventilated ; I could not make up my mind to thin any of these bunches by removing some of their berries, but certainly would remove a whole bunch (when too many on the vine). In removing the number of bunches on a vine I would take care to remove the highest first, the nourishing fluid loosing a good deal in water during its run along the wood and before reaching them.

Those vine growers in Victoria who own and cultivate from 10 to 50 acres of table grapes only, and supply a produce which is generally accepted as the pride of Melbourne fruit shops, do not thin their berries but remove bunches here and there, when too heavy a crop is maturing. Such produce they attain by the good varieties they deal with and good cultivation. The words of Mr. F. M. Bailey, recorded by you on the thinning of fruit, should certainly be studied by all fruit-growers and his advice strictly followed ; I do not think, though that his remarks *re*-fruit in the Queensland markets, includes the grapes. It seems to me, this as well as other fruit in bunches, should not be dealt in bulk with others in the thinning question. According to Mr. Nock's remarks it is also evident, that it is an operation which requires training and quite different from thinning of other fruit.

I have with me a volume of 950 pages on viticulture, written by Dr. E. Pollaci, Professor of Botany at Rome's Viticultural College, the leading authority of the day in the Continent. I do not think he would have dealt with the subject, where all those details are given regarding the attentions to be paid to the grapes while maturing, and yet not say a single word in reference to the thinning of berries, though he advises removing whole bunches. I am, Yours truly,

C. ZANETTI.

## REPORT OF Mr. C. DRIEBERG, B.A., F.H.A.S., SUPERINTENDENT OF THE COLOMBO SCHOOL OF AGRICULTURE.

### *The School.*

The number of students on the roll was 24, about the same as in previous years, and on the results of the final examination three of the senior students were awarded certificates of merit by the Deparatment. The forestry class, which had been instituted as a sort of nucleus of the proposed School of Forestry, had unfortunately to be given up when Mr. Broun, the Conservator of Forests, went away on leave, as satisfactory arrangements could not be made for its continuance. I am aware that there has been some correspondance between Government, the Director of Public Instruction, and the Conservator of Forests, relative to the cost of the proposed forestry course at the School of Agriculture, and I trust that something definite and favourable to Mr. Broun's scheme has been arrived at by this.

With regard to the veterinary lectures, I would again emphasize the importance of establishing a small hospital or infirmary for animals, to provide students with the means of acquiring some practical experience in veterinary science. The course must always remain incomplete without such means. The hospital, which need not—and indeed had better not—be on these premises, would be almost self-supporting if economically worked on the lines of the infirmary attached to the Bombay Veterinary College and in connection with the Society for the Prevention of Cruelty to Animals.

### *Agricultural Instructors*

During the year I was given the opportunity of visiting some of the stations to which agricultural instructors had been appointed. Before that I had officially no concern with the work of the instructors. The appointments of these officers are generally made on the recommendation or at the request of Government Agents or Assistant Government Agents, who have special schemes of an agricultural nature to be carried out by

the instructors. Such are the appointments of the instructors in the Province of Sabaragamuwa.

The application for an agricultural instructor by a revenue officer may be taken as a guarantee that the operations of the instructor will be closely supervised, with the result that efficient work of a special kind will bedone. There are some instructors, however, who, having perhaps been originally appointed on the applicaion of an Agent or Assistant Agent, are at present (owing to changes in the service) left, so to speak, without a patron, and the work of such has generally little to commend it. The position of an instructor is a difficult one. He is appointed on a salary of about R30 or R40 a month, and is expected to establish a model garden, getting, if possible, the help of the boys of the nearest village school, where he has also to teach the Agricultural Primer published by the Department; the place to which he is appointed is generally a remote one, and without strong official patronage there is little opportunity for his doing useful work; he frequently experiences difficulty in obtaining a suitable site for his garden, and having secured one, all the necessary expenses of cultivation have to be met by him; there is generally no market for his produce; and, what with lodging and boarding himself, he finds, if he attempts to maintain a well-stocked garden of any pretensions, that he is out of pocket at the end of each season. But when an instructor receives no help or encouragement from the higher officials and villagers show no interest in his work, and when he finds that his garden is not regularly inspected, he would appear to lose heart, and begin to think that it would be best to try and save something for himself from his salary, while keeping up an inexpensive show of a few plots stocked with easily grown native vegetables. The experiment of sending out Government paid agricultural instructors has, I think, in the main proved a failure, and been the indirect means of bringing much discredit on the School. Whatever may have been the original intention of the appointments (presumably the popularizing of an improved system of paddy cultivation) and the provision for maintaining the work of the instructors at a satisfactory standard, it cannot be denied that their continuance is not justified by present circumstances. In saying this I do not mean to deprecate the appointment of instructors for special work under the direct control of revenue officers. It is for the present sufficient, I think, that the Government provides the means of a cheap agricultural education to the natives of the country without also providing so-called instructors, who, with vaguely defined duties of doubtful utility, need special arrangements for the inspection of their work. The expenditure on maintaining instructors would, in my opinion, be better utilized in the encouragement of native agriculture by the offering of awards for superior produce and stock and careful cultivation, in connection with a scheme for holding agricultural shows, which are recognized in rural economy as strong incentives to activity, a ready means of testing the possibilities of soil and climate and the capabilities of the cultivator, and as convenient centres of communication where much useful knowlede is disseminated.

*The Government Dairy.*

On 1st January the dairy herd was composed of 79 cows, 46 calves, 1 stud bull, and 2 draught bullocks. During the year 7 Sind cows and a stud bull of the same herd were purchased locally for R1,250.

At a public sale held at the dairy on 12th July the following animals and utensils were sold: 12 cows, 15 calves, a butter churn, and a milk churn. The amount realized by the sale, after deducting all expenses connected therewith, was R1,267·23.

During the year the number of calves was increased by 44, and 10 succumbed to ordinary calf ailments. So that on 31st December the herd was composed of 74 cows (64 Sind and 10 Coast cows), 65 calves (33 male and 32 female), 2 stud bulls, and 2 draught bulls, the total number of animals in the herd thus aggregating 143.

The net profits on dairy produce for the first half-year were only about R70, the working during some of the months resulting in heavy loss, as, for instance, in March, when the loss was nearly R280. This is solely to be attributed to the effects of the outbreak of "murrain" in the previous year, which threw the machinery of the dairy completely out of gear, both by the loss of cows and calves, and by the large number of abortions which followed the outbreak.

During the second half-year the net profits on dairy produce per month exceeded R300, and it is fair to assume that in ordinary working years under normal conditions the annual profits should be about double what they were last year. Indeed the profits of the year, a little over R2,000, are practically the profits on the second half-year's working, and approximate to the net returns during the first seven months of the dairy's existence (June to December, 1893), nearly R2,500. It will in many ways be interesting to compare the working of the Ceylon Government Dairy with that of the Poona Government Dairy. The Superintendent of the latter Institution, Mr. James Mollison, rendered me much help in the first stocking of our dairy, and I have also taken the Poona Dairy as my model in many particulars It is strange to find how similar have been the experiences of the two institutions, as will be seen on perusal of the extracts from Mr. Mollison's last report given below:—

The financial results are shown in the appended balance sheet. The profit for the year is R266-11-6, as against R2,254-13-2 last year.

The reason why the margin of profit is so small is due to a very serious outbreak of rinderpest during the year. If reference is made to appendix V., it will be seen that 54 cattle died during the year; of these, 1 cow (our best Aden) was poisoned (intentionally I believe), 1 cow died from inflammation of the lungs, and a few calves were lost, as they ordinarily will be. There were 34 deaths due directly to rinderpest, and some calves which recovered from disease died from after-effects. They never recovered their strength though well cared for. The indirect loss due to diminished milk yield in the healthy cattle was probably more than that from death. The disease first broke out amongst unweaned calves, and these had necessarily to be separated from their dams.

The maternal instincts of Indian cattle are very strong, and the effect of separation from the calves upon the milk yield, especially of the buffaloes, was remarkable. The cattle were in full milk at the time, the whole herd giving about 700 lb. daily. A week after the rinderpest appeared the daily yield was about 450 lb., representing a daily loss of R18. It seems to be practically impossible to wean calves at birth from Indian milk cattle unless done when the heifer has her first calf, but the above results point to the necessity of doing so if possible. The carcases of the cattle that died were all burnt. This, with medicines, cost R266.

The number of deaths was about 70 per cent of affected cases.

* * * *

Cows advanced in pregnancy were hopeless cases. Symptoms of abortion became apparent, and inversion of the uterus resulted in every case. We had a post-mortem examination on one of these cases, and the fœtus was found to have characteristic rinderpest symptoms.

As far as I could judge, careful veterinary treatment did very little good. The most effective medicine was carbolic acid given in gruel, its influence being a healing one on the highly inflamed membranes of the intestines. I believe the cure of cases to have been chiefly due to careful nursing and to drenching the animals with good gruel. The gruel consisted of linseed boiled with rice, fresh separated milk, and water. We got rid of the disease by segregation.

* * * *

The dairy produce from about 70 milch cattle was sold for R15,303, cattle food, fodder, and grazing cost R10,968. There was a stock of fodder on hand at the end of the year worth R1,507. If the dairy herd keeps healthy, there will be no difficulty in any year in making the dairy a profitable institution. The price of dairy produce supplied to the Commissariat Department for sick soldiers in hospitals is lower than the rates charged to the public. The latter rates are fixed purposely higher than the rates of private dairy-men in Poona. Yet we could sell to private families to a much greater extent than is done now if there was an available supply, which there is not.

It would appear from Mr. Mollison's report that the milk produced by the healthy cattle during the prevalence of cattle plague was sold, but this was not permitted at the dairy, which had been declared an infected area by the Municipal authorities; so that the loss occasioned by the reduction in the output of milk has to be increased by the value of the produce of the healthy cows, which, in terms of a local Government regulation, had to be thrown away. The total loss to the dairy in this way has been estimated at R8,000. For purposes of comparison, I may mention that the loss in cattle to the dairy through cattle plague was 17 cows, 18 calves, and 2 bulls, or 37 in all; while the profits including the revenue from sale of cattle in 1894 (the year of the murrain) was R364·88. The dairy practically supplies only Government institutions with milk at the rate of 18 cents per bottle of 26 oz., but when there is any surplus of milk this is sold to the public at 20 cents. There are constant applications for milk from the dairy on the part of the public (proving that a good business could be done in this direction), While the dairy authorities are frequently asked to select and purchase cows for private parties.

At least one dairy has been established on the lines of the Government Dairy, and there is a likelihood of more springing up now that greater confidence is being engendered by the success of the Government establishment. As already stated, the revenue from sale of cattle last year was R1,267 23. If this amount be added to the net profits on dairy produce alone (R2,161·50), we get the total of R3,428·73 as the net profits on the transactions of the dairy for the past year.

In concluding this part of my report I must not omit to place on record the good work done by Mr. Rodrigo, the Manager of the Dairy.

## GENERAL ITEMS.

To clean cereal seed before sowing, it is a good plan to shake it in a sieve with meshes small enough to retain the cereal seed but permits most weed seed to go through.

To prevent crows pulling up newly sown corn it is advised that after placing the seed in a box, boiling water should be poured over to heat it and a small quantity of liquid coal tar sprinkled. The mass should be shoveled until the tar is well distributed ever each seed; then dry it off thoroughly by sprinking on some fine dry plaster or earth, and working the mass over until every seed is covered over with the drying substance.

The N. S. W. Agricultural Gazette states that the explaination given with regard to the splitting of the skin of fruits is that is caused by a sudden rapid increase in the growth of the fruit which is not accompanied by a corresponding growth of the skin. This often takes place when rain falls after a long dry spell, during which the natural growth of the fruit is checked. The remedy, therefore, is to apply water to the trees when it is seen they are beginning to suffer from drought, and so maintained a constant and regular growth of the fruit."

In bulletin No. 24 of the Texas experiment station, the following occurs under the head of "measures to destroy the ticks." Almost any greasy or oily substance applied to the parts affected will destroy them. I failed with a decoction of tobacco, and also with crude petroleum. A combination of lard and sulpher or lard and kerosine gives good results. Kerosine emulsion of 10 per cent does fairly well. At one time I entertained a high opinion of this preparation, but later experiences have failed to fully satisfy the demands.

We have found nothing that gives so general satisfaction as several brands of sheep dip that are on the market. These were applied at 2 per cent strength in water. The ones employed by us were Cannon's Hayward's, and Little's. There are others, perhaps, of equal value. The qualities that these possess are efficiency, cheapness, ease of application, mixable with water, nonpoisonous, non-irritating or injurious to eyes, skin, or hair, stability, uniformity of strength, non-corrosise to apparatus for application, and no heating required.